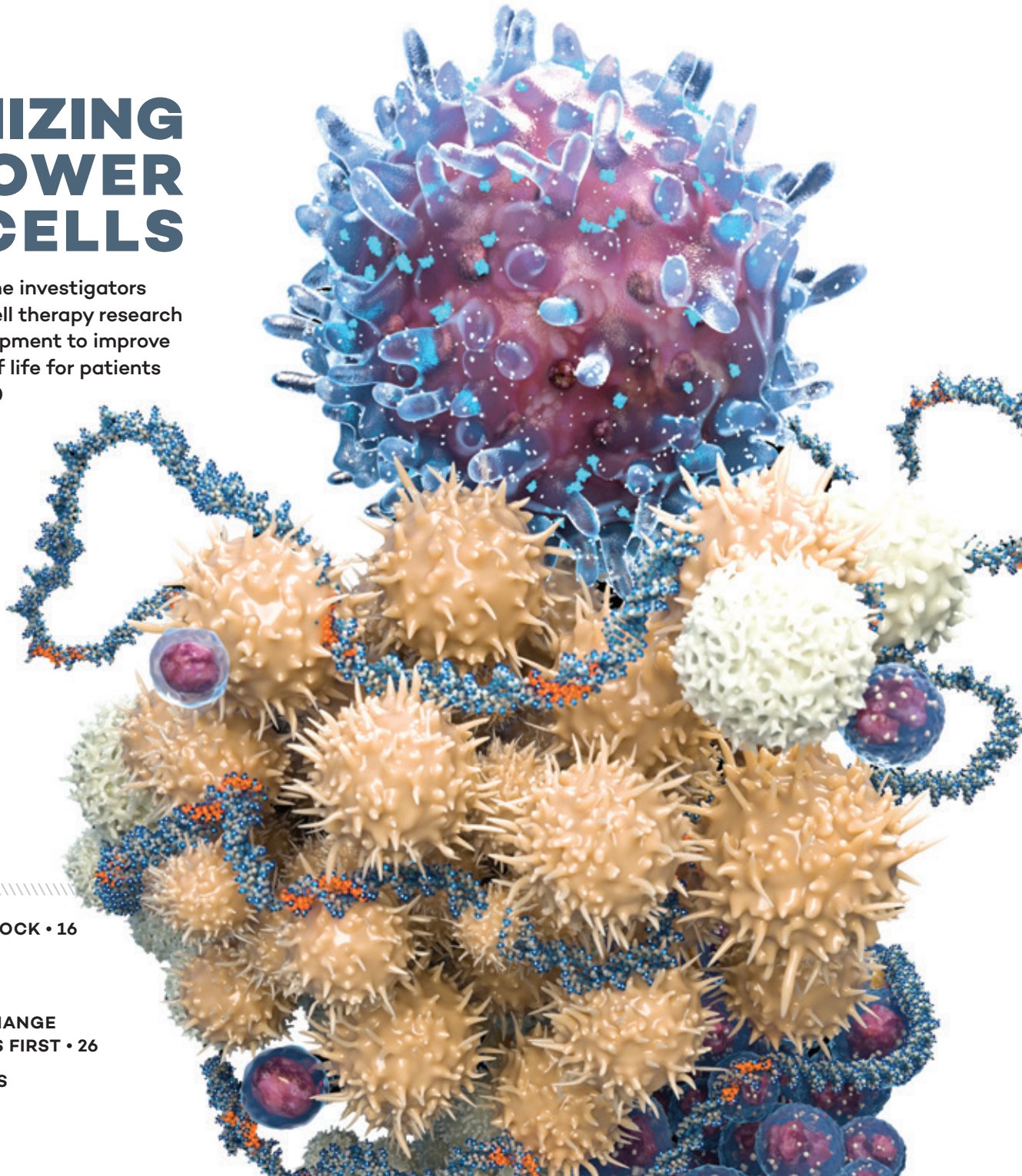
Northwestern Medicine

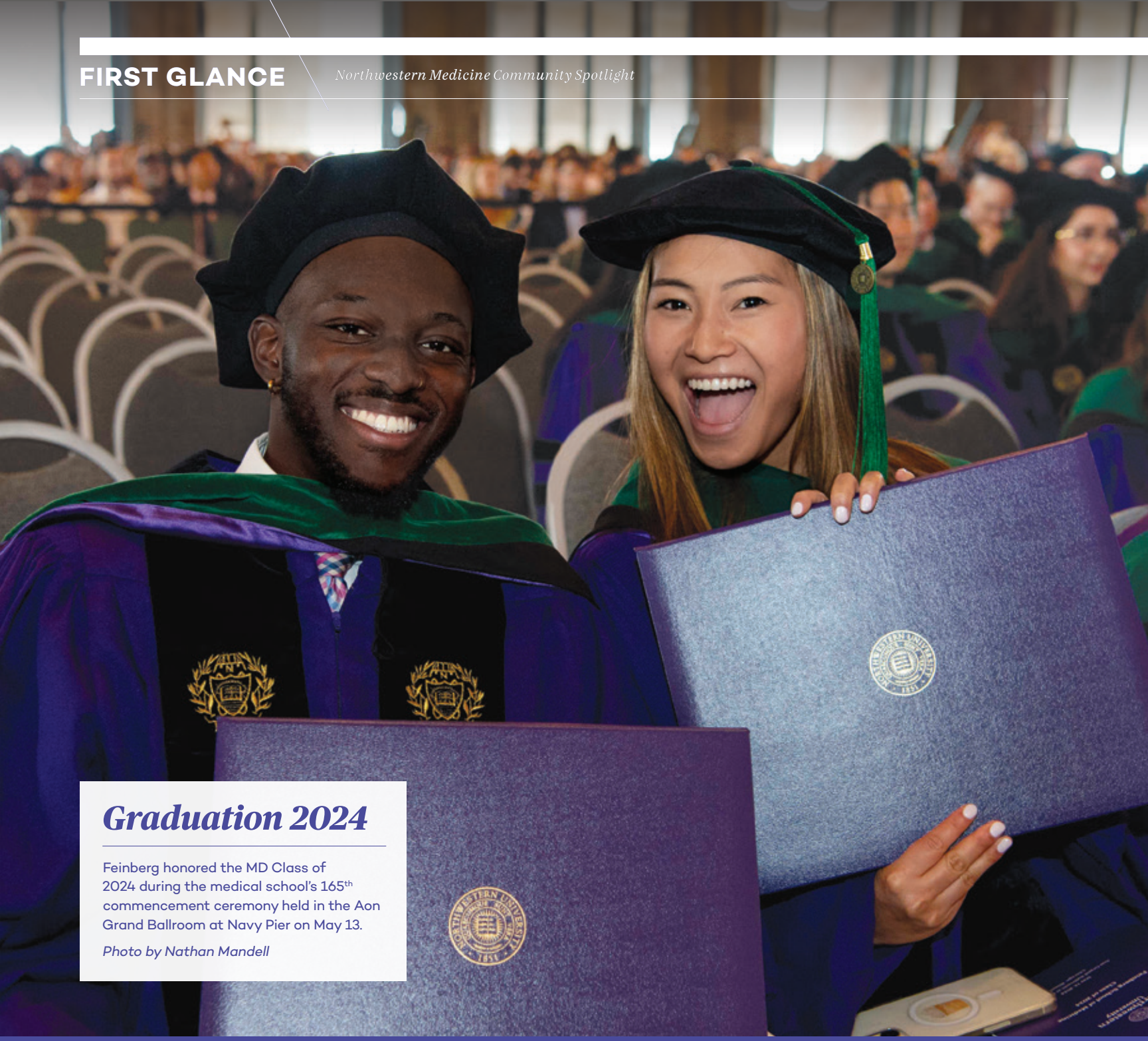
SPRING/SUMMER 2024

MAXIMIZING THE POWER OF T-CELLS

Northwestern Medicine investigators are steering CAR T-cell therapy research and treatment development to improve survival and quality of life for patients with cancer. • page 20



INSIDE



Graduation 2024

Feinberg honored the MD Class of 2024 during the medical school's 165th commencement ceremony held in the Aon Grand Ballroom at Navy Pier on May 13.

Photo by Nathan Mandell

Northwestern Medicine magazine is published quarterly for alumni and friends of Northwestern University Feinberg School of Medicine, Northwestern Memorial HealthCare, and the McGaw Medical Center of Northwestern University.

Editor: Brooke Morris-Chott, MPS

Editorial Assistant: Katelyn May

Contributing Writers: Emily Ayshford, Olivia Dimmer, Christina Frank, Bridget Kuehn, Melissa Rohman, Cheryl SooHoo

Editorial Advisors: Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean; Alan Krensky, MD, vice dean for Development and Alumni Relations; Nicole Mladic, executive director of Communications; Babette Nyka, director of Alumni Relations

Alumni Association: Nupur Ghoshal, '01 PhD, '03 MD

Design: Taylor Design

Email us at medcommunications@northwestern.edu

Address all correspondence to: Northwestern University, Feinberg School of Medicine, Office of Communications, 420 E. Superior Street, Rubloff 12th Floor, Chicago, IL 60611

Connect with NM online:

fb.me/northwesternfeinberg

twitter.com/nufeinbergmed

instagram.com/nufeinbergmed

linkedin.com/school/northwestern-university-feinberg-school-of-medicine

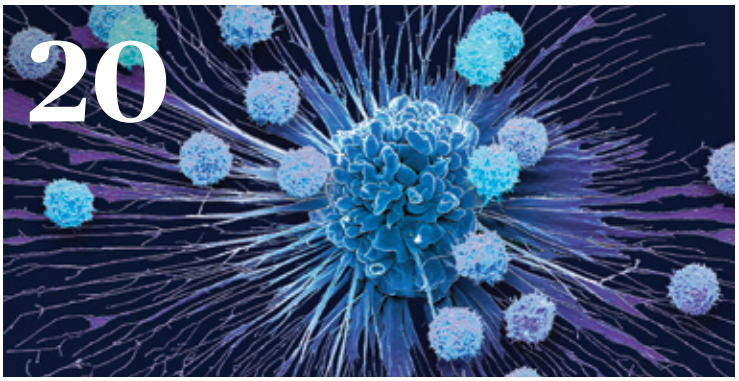
Don't miss NM web extras!

Catch up on the latest Northwestern Medicine news and check out more photos and videos online at magazine.nm.org.

Features

TURNING BACK THE CLOCK

A new longitudinal study within the Human Longevity Laboratory investigates aging, with the ultimate goal of finding ways to reverse its negative effects.



MAXIMIZING THE POWER OF T-CELLS

Northwestern Medicine investigators are steering CAR T-cell therapy research and treatment development to improve survival and quality of life for patients with cancer.

10,000 TRANSPLANTS AND COUNTING: USHERING IN A NEW ERA IN TRANSPLANTATION

Northwestern physicians mark a milestone in transplantation as they reach their 10,000th transabdominal transplant surgery.

CREATING POSITIVE CHANGE AND PUTTING PATIENTS FIRST

Susan Quaggin, MD, newly appointed chair of the Department of Medicine, focuses on advancing medicine by enhancing patient care and health equity.

Departments

ON THE COVER
T-cells evolving into a super cancer-fighting T-cell. Image courtesy of Moonlight Bio. Read more on page 20.

FROM DISCOVERY TO DELIVERY

AT NORTHWESTERN MEDICINE, WE ASPIRE TO BE A DESTINATION FOR WORLD-CLASS CARE AND talent and to be globally recognized for the advancement of healthcare, from discovery to delivery. This is an exciting time, as the field of medicine evolves at a rapid pace, with many clinical and translational breakthroughs discovered — and delivered — by our faculty and trainees in just the past year.

The Comprehensive Transplant Center at Northwestern University Feinberg School of Medicine and Northwestern Medicine Canning Thoracic Institute have been doing groundbreaking work, particularly through the DREAM Program for patients with advanced lung cancer. In a first for Northwestern Medicine, surgeons performed a double-lung and liver transplant; the patient, a physician from California, showed no signs of cancer six months after surgery. He joins several other patients who had been given a terminal diagnosis before coming to Northwestern Medicine only to be deemed cancer-free after getting a double-lung transplant through the program. (You can read more about the historic growth of the transplant program in this issue on page 23.)

Northwestern Medicine Bluhm Cardiovascular Institute and the Feinberg Cardiovascular and Renal Research Institute continue to lead in cardiovascular care, particularly in the area of atrial fibrillation (AFib). This year, the Bluhm Cardiovascular Institute team became the first in Illinois to offer the new, minimally invasive procedure called pulsed field ablation to treat AFib.

In an exciting collaboration between the university and the academic medical center, our neurosurgery team became the first in the U.S. to successfully use the Hubly Drill, invented by Northwestern University student Casey Qadir, to save the life of a patient in the ICU. Qadir studied neurosciences as an undergraduate and created the drill through a post-graduate course called NUvention Medical, funded by Farley Center for Entrepreneurship and Innovation at Northwestern University. The drill is said to be faster, safer, and more accurate than standard hand-crank drills and has the potential to make a major impact on the field of neurosurgery.

We are celebrating other "firsts" that you can read about in this issue. On page 26, you will find an interview with Susan Quaggin, MD, the first woman to serve as chair of the Department of Medicine. On page 16, you will read about the Potocsnak Longevity Institute's newly opened Human Longevity Lab, which seeks to develop methods to improve the human lifespan so people can live longer, healthier lives. And on page 20, you will learn about a novel study from Northwestern Medicine investigators and their collaborators that created T-cells 100 times more potent at killing cancer cells without toxicity.

In this environment ripe with the promise of discovery, our students and trainees have wonderful new opportunities to learn from our physicians and scientists who are shaping the future of medicine. Our commitment to training the next generation of medical professionals and physician-scientists has never been stronger; our Research Intensive Scholarly Emphasis (RISE) program and Area of Scholarly Concentration (AOSC) for students and Starzl Academy for trainees have substantially elevated our academic accomplishments. In addition to our faculty h-index of 187 (14th among top 20 medical schools), our graduating MD classes now average more than 500 publications collectively, which garnered 10,000 citations in the past year. For the 2024 graduating MD class at Feinberg, 68 percent will begin residencies at top 25 institutions nationwide, and 21 percent are members of the Alpha Omega Alpha (AOA) medical honors society. We are proud of their accomplishments and wish them all the best as they go forward. And we are delighted to welcome our new class of stellar residents to campus. This year, 41 percent of our new residents matched from a top 25 medical school, and 28 percent are members of AOA.

Our students and trainees are poised to leave an indelible mark on their chosen field, and we could not be prouder.

With warm regards,

Eric G. Neilson, MD
Vice President for Medical Affairs
Lewis Landsberg Dean
Northwestern University Feinberg School of Medicine

Howard B. Chrisman, MD
President and Chief Executive Officer
Northwestern Memorial HealthCare

Faculty Recognized for Contributions to Science

Feinberg Faculty Inducted into American Society for Clinical Investigation


Amani Fawzi, MD


Craig Horbinski, MD, PhD


Sanjiv Shah, '00 MD


Benjamin Singer, '07 MD, '10 GME

Four Feinberg faculty members have been inducted into the American Society for Clinical Investigation (ASCI), one of the nation's oldest medical honor societies composed of more than 3,000 physician-scientists. Three additional Feinberg faculty members have also been honored with the ASCI Young Physician-Scientist Award, which recognizes physician-scientists who are early in their first faculty appointment and have made notable achievements in their research.

This year's ASCI inductees include Amani Fawzi, MD, the Cyrus Tang and Lee Jampol Professor of Ophthalmology; Craig Horbinski, MD, PhD, director of Neuropathology in the Department of Pathology; Sanjiv Shah, '00 MD, the Neil J. Stone, MD, Professor of Medicine in the Division of Cardiology; and Benjamin Singer, '07 MD, '10 GME, the Lawrence Hicks Professor of Pulmonary Medicine.

The Feinberg faculty members who were honored with the ASCI Young Physician-Scientist Award are: SeungHye Han, MD, MPH, assistant professor of Medicine in the Division of Pulmonary and Critical Care; Fei Li Kuang, MD, PhD, assistant professor of Medicine in the Division of Allergy and Immunology; and Whitney Stevens, MD, PhD, '13, '14 GME, assistant professor of Medicine in the Division of Allergy and Immunology and of Otolaryngology – Head and Neck Surgery.

Hersam Appointed to National Academy of Engineering and American Academy of Arts and Sciences

Mark C. Hersam, PhD, the Walter P. Murphy Professor of Materials Science and Engineering and director of the Materials Research Center at Northwestern University, has been elected to the National Academy of Engineering (NAE). Hersam, who also holds faculty appointments in the Departments of Chemistry, Applied Physics, Medicine, and Electrical Engineering, is one of 114 new members and 21 new international members inducted in the NAE in 2024.

Hersam, whose research interests include nanomaterials, nanomanufacturing, scanning probe microscopy, nanoelectronic devices, biosensors, and renewable energy, was also one of six Northwestern University faculty members to be elected to the American Academy of Arts and Sciences in 2024.

Krainc, Kelley Elected to National Academy of Inventors


Dimitri Krainc, MD, PhD


Shana Kelley, PhD

Dimitri Krainc, MD, PhD, the Aaron Montgomery Ward Professor and chair of the Ken and Ruth Davee Department of Neurology, and Shana O. Kelley, PhD, the Neena B. Schwartz Professor of Chemistry and Biomedical Engineering at the Weinberg College of Arts and Sciences and the McCormick School of Engineering, professor of Biochemistry and Molecular Genetics at Northwestern University Feinberg School of Medicine, and president of the Chan Zuckerberg Biohub Chicago, have been named 2023 fellows of the National Academy of Inventors (NAI).

NAI fellow status is the highest professional distinction awarded solely to academic inventors. The program recognizes academic inventors who have demonstrated a "spirit of innovation" by creating or facilitating inventions that have made a tangible impact on quality of life, economic development and social welfare.

Kelley and Krainc are among 162 new fellows in the 2023 class, which represents 118 research universities and governmental and nonprofit research institutions worldwide. The 2023 class collectively holds more than 4,600 issued U.S. patents.

Celebrating Match Day 2024

At the Louis A. Simpson and Kimberly K. Querrey Biomedical Research Center on Northwestern's Chicago campus, fourth-year Feinberg students excitedly tore open envelopes to reveal their residency matches at this year's Match Day celebration on March 15.

"This day is so exciting not only to me but also for my classmates because it's the culmination of all this hard work, and it's exciting to see not only where I'm going, but to see where everyone else is going and have this joint celebration together," says Maggie Danziger, who matched into Orthopaedic Surgery at Thomas Jefferson University in Philadelphia.

Feinberg students, their families, and friends attended this year's Match Day celebration. Match Day, an annual tradition held on the third Friday in March, is when fourth-year medical students across the U.S. learn where they will complete their residency training for the next three to seven years.

"Let's take in this moment surrounded by your families, your friends, your significant others, and your classmates to celebrate all the hard work you've done. I'm so proud of all of you," says Eli Zimmerman, MD, associate dean for Student Affairs and associate professor in the Ken and Ruth Davee Department of Neurology's Division of Stroke and Vascular Neurology.

Marianne Green, MD, the Raymond H. Curry, MD, Professor of Medical Education and vice dean for Education, addressed students and their families before the envelopes were opened and matches were revealed.

"There are some hard years ahead for you in your training in your residency, but I know that each and every one of you has got this," Green proclaims. "Given that you've made it through the hardest part of training yet in medical school, I know each and every one of you will succeed."

From this year's class, 135 students matched in 23 different ACGME-certified residency specialties, with 68 percent of Feinberg's matching students heading to programs affiliated with a top 25 U.S. medical school.

"Match Day is one of those traditions you think about when going into medicine, and today just feels unreal — it's where we get to

WRITTEN BY *Melissa Rohman*

figure out where all our hard work brought us," says Evan Edwards, who matched into Otorhinolaryngology (ENT) at The Ohio State University.

This year, the most popular specialties students matched into included internal medicine, pediatrics, anesthesiology, orthopaedic surgery, ophthalmology, and psychiatry.

"It's a really interesting feeling to be at this point in my medical training because today feels just as much an end as it does a beginning. It's a reflection of all the years of work I've had at Feinberg and also a reflection of how much more there is to learn," states Trisha Kaundinya, who matched into Internal Medicine/Dermatology at Mass General Brigham at Harvard University.

Roger Smith, who matched into Internal Medicine at the McGaw Medical Center of Northwestern University, has been working towards his medical degree and doctorate through Feinberg's Medical Scientist Training Program (MSTP) and said he feels both excited and well prepared for his transition into the next phase of his career in the Department of Medicine's Physician-Scientist Training Program.

"Northwestern has made me feel very prepared for residency, from the classroom-based learning in the first couple years through all the clinical training phases, I've just felt really supported within that training environment," Smith says.

Dinushi Kulasekere, who matched into General Surgery at Baylor College of Medicine, thanked Feinberg faculty members for supporting her throughout her medical school journey and for inspiring her to become a caring healthcare provider.

"This has been an amazing day, and I want to thank Feinberg for everything they've done for us and for preparing us so well and for giving me the opportunity to fulfill my dreams," Kulasekere says.

WEB EXTRA
Relive the excitement of Match Day 2024.

68%
MATCH RATE AT TOP 25 RESIDENCY PROGRAMS.

PHOTOGRAPHY BY *Nathan Mandell* AND *Olivia Dimmer*

Health Equity Week Explores the Leap From Promises to Practice

In February, faculty, residents, trainees, and students from Feinberg, the local community, and beyond came together for Health Equity Week, a weeklong series of educational programming designed to expose the roots of healthcare inequities as well as the avenues to address them.

Hosted by the McGaw Medical Center of Northwestern University, the fourth installment of Health Equity Week featured presentations from healthcare equity leaders from around the country.

"My hope is that each of our participants find ways that they personally can take the lessons learned and implement health equity into their day-to-day practice," says Linda Suleiman, MD, '17 GME, associate dean for diversity, equity, and inclusion and assistant professor of Orthopaedic Surgery and of Medical Education.

Director of diversity and inclusion at McGaw, Suleiman is one of the original organizers of Health Equity Week.

"Health equity is a non-negotiable," says Oluwateniola Brown, MD, '18 GME, assistant professor of Obstetrics and Gynecology in the Division of Female Pelvic Medicine and Reconstructive Surgery and director for Diversity and Inclusion at McGaw. "Everything we do has to be equity-driven and must have an equity focus."

Brown, another one of the original Health Equity Week organizers, introduced this year's keynote speaker, Erica Taylor, MD, MBA, assistant professor of Orthopaedic Surgery and vice chair of diversity, equity, and inclusion at Duke University School of Medicine.

Sessions throughout the week focused on topics ranging from understanding lung cancer through an equity lens to building an equitable approach to colorectal cancer screening among Black Americans.

"There's a lot of work that we've been doing in vulnerable population care and trying to understand and help humanize the patients that we take care of," says Natasha Nichols, MD, assistant professor of Medicine in the Division of Hospital Medicine and one of the creators of Jesse Brown 4 Black Lives, a taskforce at Jesse Brown VA Medical Center designed to address healthcare inequities impacting Black patients.

"We recognize that what happens to them outside of the four walls of our exam room is very relevant and that we need to develop better strategies for addressing this."

> ***"My hope is that each of our participants find ways that they personally can take the lessons learned and implement health equity into their day-to-day practice."***
>
> **LINDA SULEIMAN, MD, '17 GME**

WRITTEN BY *Olivia Dimmer* AND *Melissa Rohman* • PHOTOGRAPHY BY *Randy Belice*

WOMEN IN MEDICINE CONFERENCE CELEBRATES EMPOWERMENT AND SUCCESSES

Women in the healthcare field and their allies convened in the Feinberg Pavilion at Northwestern Memorial Hospital in March to celebrate women's empowerment and success during the sixth annual Women in Medicine Conference.

With the theme "Empowering Success," this year's conference featured a day of presentations, panels, and Q&A sessions sharing strategies and knowledge about achieving equality in the workplace, wellness, and work-life balance, mentorship, and career development. The conference also coincided with International Women's Day.

"I think it's fitting that our conference today falls on International Women's Day, which is a day that is dedicated to the empowerment, enrichment, and the celebration of women," says Manjot Gill, MD, professor of Ophthalmology and of Medical Education, who was a co-organizer of this year's conference.

Sadiya Khan, '09 MD, '14 MSc, '10, '12 GME, the Magerstadt Professor of Cardiovascular Epidemiology, and Shawn Smith, MD, assistant professor of Pediatrics in the Division of Hospital-Based Medicine, were also co-organizers of the conference.

Howard Chrisman, MD, chief executive officer of Northwestern Memorial HealthCare, delivered opening remarks and spoke about women in healthcare leadership who are continuing to break the glass ceiling for themselves and other women in the field and creating new pathways for success.

During an afternoon session, Santina Wheat, MD, MPH, '13 GME, vice chair of diversity, equity, and inclusion in the Department of Family and Community Medicine, spoke about how integrating diversity, equity, and community can support leadership growth and the importance of saying "no" to prevent burnout and promote work-life balance.

"We need to encourage folks to feel like they can say 'yes' to the things they're passionate about, but also decide if it's something they can offer to someone else and support them," Wheat says.

In another afternoon session, Ngozi Ezike, MD, president and CEO of Sinai Chicago and former director of the Illinois Department of Public Health, spoke to attendees about her experience leading the state of Illinois through public health initiatives during the COVID-19 pandemic and how to be a strong and decisive leader during a crisis.

"Lean into making a decision. Understand that you could get it wrong, but be ready to course-correct," Ezike states. "When those challenges come, don't turn and run. Lean in."

MEDICAL HONOR SOCIETY INDUCTS NEW FEINBERG MEMBERS

Feinberg's chapter of the Alpha Omega Alpha (AOA) medical honor society welcomed 40 new members during a ceremony on March 12, recognizing the inductees' outstanding educational achievement and significant contributions to medicine.

"This year, we induct the 121st class of Alpha Omega Alpha here at Northwestern, where we get to honor students, faculty, and house staff who have done a superb job in terms of patient care, excelling in research, and demonstrated compassion and service to our community," says Shilajit Kundu, MD, '07 GME, chief of Urologic Oncology in the Department of Urology, who welcomed guests to the ceremony.

Kundu, who also serves as AOA councilor for Feinberg, introduced Susan Quaggin, MD, the chair and Irving S. Cutter Professor of Medicine, who delivered the keynote lecture prior to the induction ceremony.

Following Quaggin's lecture, Eli Zimmerman, MD, associate dean for Student Affairs, welcomed 30 new medical student members into AOA.

New housestaff inductees were announced by Joshua Goldstein, MD, senior associate dean for Graduate Medical Education, professor of Pediatrics in the Division of Neurology and Epilepsy and in the Ken and Ruth Davee Department of Neurology.

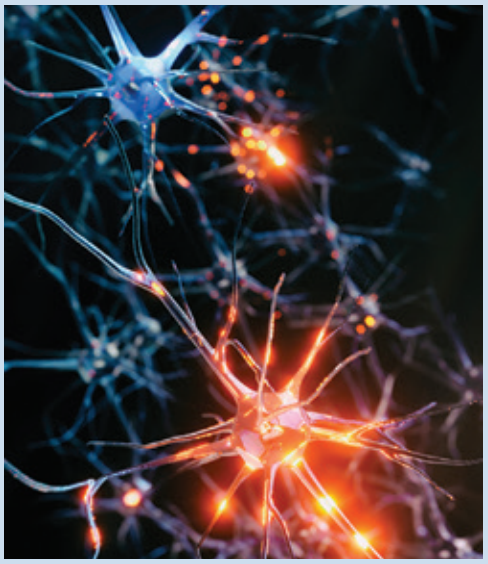
"Being inducted into AOA is a great honor — it means a lot to have this recognition from my program leadership," states Asantewaa Ture, MD, the VA and health equity/advocacy chief medical resident at the Jesse Brown VA Medical Center, who was also inducted into AOA. "I am humbled and very appreciative of this award."

PHOTOGRAPHY BY *Melissa Rohman* AND *Nathan Mandell*

RESEARCH BRIEFS

SCIENTIFIC ADVANCES

PROBING DEEPER TO UNDERSTAND PROTEIN EXPRESSION IN NEURONS



Northwestern Medicine investigators have developed a method to measure protein expression in an individual neuron, a discovery that will enable scientists to study how this process goes awry in disease, according to a study published in *Molecular Psychiatry*.

Neurons in the brain communicate primarily through chemical signals and disruption in neuronal communication can lead to disorders such as autism, Parkinson's, and Alzheimer's disease. Previously, scientists had no way of measuring protein expression within a single type of neuron, which limited how closely they could study dysfunctional neurons.

"We were motivated to make these new tools to actually study how synaptic proteins are changed and how these processes could contribute to the functional deficits seen in specific neurological disorders," says Jeffrey Savas, PhD, assistant professor in the Ken and Ruth Davee Department of Neurology's Division of Behavioral Neurology and senior author of the study.

In the study, Savas and his collaborators developed synaptic probes, which consisted of a virus activated by a protein present in a specific type of neuron. Once inside a mouse and activated, the virus would release a protein capable of "tagging" other proteins expressed by the neuron, allowing investigators to pinpoint, monitor, and quantify the proteins expressed in a particular type of neuron.

The study was supported by National Cancer Institute Grant CCSG P30 CA060553 awarded to the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

DISEASE DISCOVERIES

Using Cancer's Strength to Fight Against It

Northwestern Medicine scientists, along with collaborators University of California, San Francisco (UCSF), may have found a way around the limitations of engineered T-cells by borrowing a few tricks from cancer itself, in findings published in *Nature*.

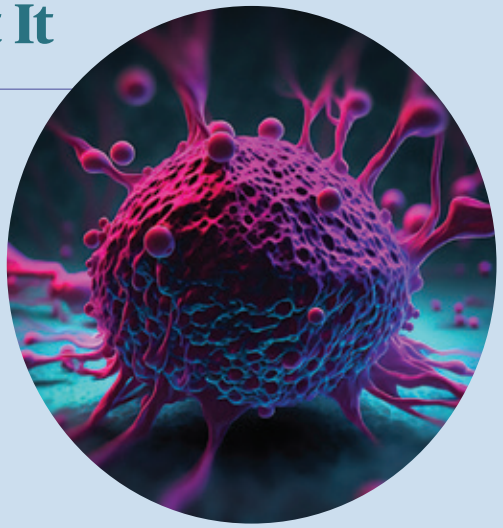
By studying mutations in malignant T-cells that cause lymphoma, they zeroed in on one that imparted exceptional potency to engineered T-cells. Inserting a gene encoding this unique mutation into normal human T-cells made them more than 100 times more potent at killing cancer cells without any signs of becoming toxic.

While current immunotherapies work only against cancers of the blood and bone marrow, the T-cells engineered by Northwestern and UCSF were able to kill tumors derived from skin, lung, and stomach tissue in mice. The team has already begun working toward testing this new approach in people.

"We used nature's roadmap to make better T-cell therapies," says Jaehyuk Choi, MD, PhD, associate professor of Dermatology and of Biochemistry and Molecular Genetics at Northwestern University Feinberg School of Medicine. "The superpower that makes cancer cells so strong can be transferred into T-cell therapies to make them powerful enough to eliminate what were once incurable cancers."

"Mutations underlying the resilience and adaptability of cancer cells can super-charge T-cells to survive and thrive in the harsh conditions that tumors create," says Kole Roybal, PhD, associate professor of microbiology and immunology at UCSF, center director for the Parker Institute for Cancer Immunotherapy Center at UCSF, and a member of the Gladstone Institute of Genomic Immunology.

The research was supported by the Parker Institute for Cancer Immunotherapy, NIH grants (grants F30 CA265107, T32 CA009560, 1DP2AI136599-01, and DP2 CA239143), Cancer Moonshot grant U54 CA244438, the Mark Foundation for Cancer Research, the Bakewell Foundation, and UCSF Helen Diller Family Comprehensive Cancer Center.



INSERTING A GENE ENCODING THIS UNIQUE MUTATION INTO NORMAL HUMAN T-CELLS MADE THEM MORE THAN 100 TIMES MORE POTENT AT KILLING CANCER CELLS WITHOUT ANY SIGNS OF BECOMING TOXIC.

WRITTEN BY *Olivia Dimmer, Melissa Rohman,* AND *Kristin Samuelson*

CLINICAL BREAKTHROUGHS

Study Identifies Disparities in End-of-Life Care for Lung Cancer Patients

Patients with lung cancer who were Asian/Pacific Islander, Black, or Hispanic experienced a higher intensity of end-of-life care compared to white patients, according to a Northwestern Medicine population-based analysis published in the *Journal of Clinical Oncology*.

"When we think about patients with cancer and end of life, there's a lot of research that shows that most patients would prefer not to be in the hospital. Dying in the hospital or spending last days in the hospital is not associated with better outcomes, it's not associated with higher quality of life, it's costly and it sometimes goes against the patient's wishes. So, the goal is how do we prevent this from happening — from patients dying in the hospital and receiving this intense care that may not be helpful and that they may not even want," says Gladys M. Rodriguez, MD, MS, assistant professor of Medicine in the Division of Hematology and Oncology and lead author of the study.

Lung cancer is a leading cause of death in the U.S., according to the Centers for Disease Control and Prevention. The current five-year survival rate is low, approximately 26.6 percent, because the cancer is typically detected and diagnosed when it has already advanced into later stages, according to a 2023 report from the American Lung Association.

This work was supported in part by the California Initiative to Advance Precision Medicine.

26.6% THE CURRENT FIVE-YEAR SURVIVAL RATE FOR LUNG CANCER

CLINICAL BREAKTHROUGHS

SHAPE-SHIFTING ULTRASOUND STICKERS DETECT POST-SURGICAL COMPLICATIONS

Investigators led by Northwestern University and Washington University School of Medicine in St. Louis have developed a new, first-of-its-kind sticker that enables clinicians to monitor the health of patients' organs and deep tissues with a simple ultrasound device, as described in a study published in *Science*.

When attached to an organ, the soft, tiny sticker changes in shape in response to the body's changing pH levels, which can serve as an early warning sign for post-surgery complications such as anastomotic leaks. Clinicians then can view these shape changes in real time through ultrasound imaging.

Currently, no existing methods can reliably and non-invasively detect anastomotic leaks — a life-threatening condition that occurs when gastrointestinal fluids escape the digestive system. By revealing the leakage of these fluids with high sensitivity and high specificity, the non-invasive sticker can enable earlier interventions than previously possible. Then, when the patient has fully recovered, the biocompatible, bioresorbable sticker simply dissolves away — bypassing the need for surgical extraction.

"We developed an engineering approach and a set of advanced materials to address this unmet need in patient monitoring," says John A. Rogers, PhD, the Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, Biomedical Engineering and Neurological Surgery at Northwestern's McCormick School of Engineering and Northwestern University Feinberg School of Medicine, who led device development with postdoctoral fellow Jiaqi Liu, PhD. "The technology has the potential to eliminate risks, reduce costs, and expand accessibility to rapid, non-invasive assessments for improved patient outcomes."

The study was supported by the National Science Foundation, the National Cancer Institute, and the Querrey-Simpson Institute for Bioelectronics.

CLINICAL BREAKTHROUGHS

WEIGHT LOSS DRUG SHOWS BENEFITS FOR HEART FAILURE

The drug semaglutide, sold under brand names Ozempic and Wegovy, can help reduce heart failure symptoms and reduce heart failure hospitalizations in patients with obesity, according to a pair of studies published in *The Lancet* and *The New England Journal of Medicine* (NEJM).

The studies, which provide new results from two clinical trials, compared the effects of semaglutide versus placebo in reducing heart failure-related symptoms, physical limitations, weight and heart failure hospitalizations in patients with obesity and heart failure with preserved ejection fraction, or HFpEF.

HFpEF, which stiffens the heart muscle and stops it from filling with blood properly, affects more than half of patients with heart failure and has limited treatment options, according to Sanjiv Shah, '00 MD, the Neil J. Stone, MD, Professor of Medicine in the Division of Cardiology, and a co-author of the studies.

Study participants who had obesity, HFpEF, and diabetes who received semaglutide lost more than double the weight of participants on placebo, were able to walk farther during a timed test, and saw a drop in heart failure and inflammation-related biomarkers, according to the trial published in NEJM, which included more than 600 participants.

"The clinical trial of semaglutide in patients with obesity-related HFpEF and diabetes added to a trial we published last year in patients with obesity-related HFpEF without diabetes. What we found in both trials was an improvement in the quality of life and a reduction in physical limitations in patients treated with semaglutide," Shah says. "We saw an improvement in their six-minute walk distance, as well as a reduction in NT-proBNP, which is a biomarker of congestion, and a reduction in C-reactive protein, a marker of inflammation."

The trials were funded by Novo Nordisk, which manufactures semaglutide.

CLINICAL BREAKTHROUGHS

Targeting Protein Interactions May Boost Antitumor Immunity in Breast Cancer

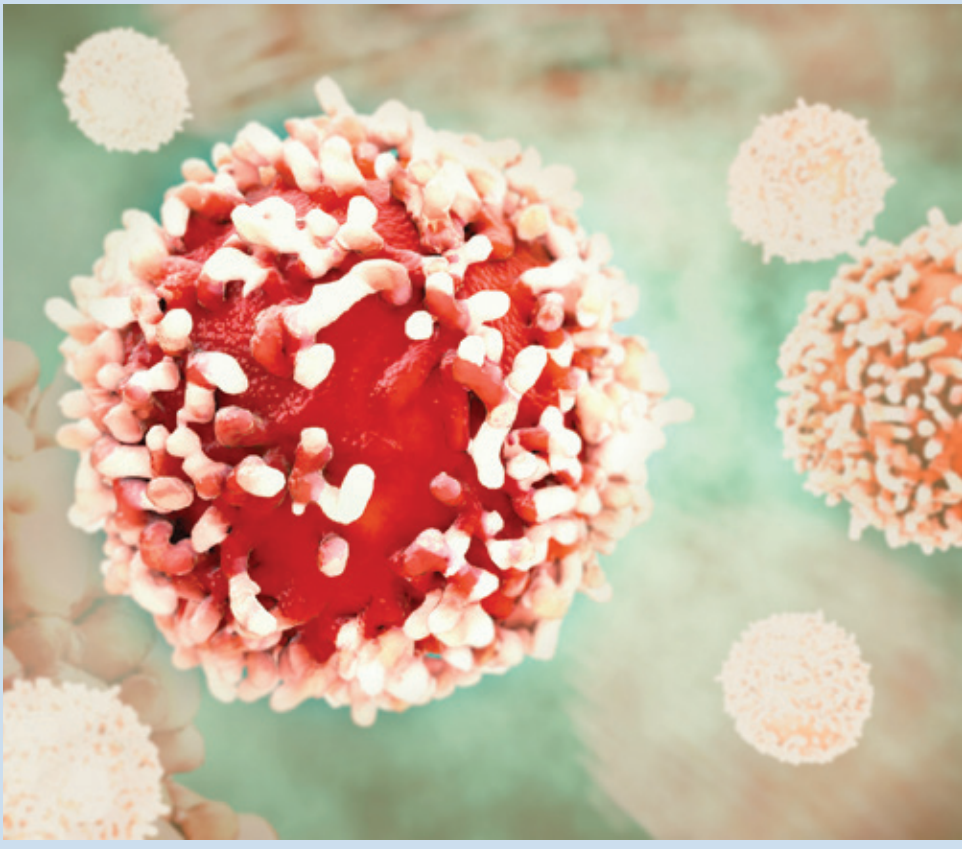
A multi-institutional team of investigators has discovered that targeting a specific protein interaction within immunosuppressive breast cancer cells may increase anti-tumor immune responses in otherwise difficult-to-treat solid tumors, according to recent findings published in the *Journal of Clinical Investigation*.

"Our findings uncover a novel strategy for targeting immunosuppressive OTUD4-CD73 proteolytic axis in treating immune-suppressive breast cancers with the inhibitor ST80," says Bin Zhang, MD, PhD, the Johanna Dobe Professor of Cancer Immunology and a co-corresponding author of the study.

"Immune-cold" tumors are those that lack effector immune cells in the tumor tissue and can therefore suppress the body's immune system from targeting and attacking the tumor cells. Most cancers, including different types of advanced breast cancer, ovarian cancer, prostate cancer, pancreatic cancer, and glioblastoma, are considered immune-cold tumors.

These tumors are also generally unresponsive to immunotherapy, underscoring the need for more aggressive and effective targeted therapies.

This work was partially supported by the National Institutes of Health grants R01CA222963, R01CA250101, and R01CA258857.



SCIENTIFIC ADVANCES

GENETIC MECHANISMS MAY REVEAL RETINAL VASCULAR DISEASE THERAPEUTIC TARGETS

Investigators led by Tsutomu Kume, PhD, professor of Medicine in the Division of Cardiology and of Pharmacology, have identified novel genetic mechanisms that regulate blood vessel growth in the retina and may also serve as therapeutic targets for retinal vascular disease, according to a Northwestern Medicine study published in *Nature Communications*.

Angiogenesis is the formation of new blood vessels from endothelial cells in existing blood vessels, a process essential for developing new organ systems and promoting tissue repair. While the molecular mechanisms of angiogenesis have been previously established, the precise genetic mechanisms that also help regulate this process have remained elusive.

Previous work from Kume's laboratory and others suggests that mutations in the *FOXC1* and *FOXC2* genes are associated with various vascular developmental defects. In the current study, the investigators studied retinal tissue from vascular endothelial cell-specific *FOXC*-knockout mouse lines to determine the role of *FOXC1* and *FOXC2* in the transcriptional regulation of retinal angiogenesis.

The investigators found that mice with the *FOXC1*-knockout demonstrated impaired retinal vascular growth and the expression of the *SLC3As* and *SLC7A5*, genes which encode CD98, an essential amino acid transporter. Furthermore, this impaired gene expression inhibited the activation of the mammalian target of rapamycin (mTOR) signaling pathway, which is essential for cellular growth and proliferation.

Using the oxygen-induced retinopathy mouse model for studying the mechanisms associated with the pathogenesis of retinopathy of prematurity, a major cause of acquired blindness in children, the investigators also found that *FOXC1* is necessary for revascularization of the retina during oxygen-induced retinopathy.

This work was supported by the National Institutes of Health grants RO1HL144129, RO1EY028304, R01HL159976, R01HL148339, and 5T32HL094293.

DISEASE DISCOVERIES

Study Discovers Potential Biomarkers of Environmental Exposures in Parkinson's Disease

A team of Northwestern Medicine investigators has discovered novel DNA methylation patterns in the blood of patients with Parkinson's disease, according to findings published in *Annals of Neurology*.

The study, led by Paulina Gonzalez-Latapi, MD, MS, assistant professor in the Ken and Ruth Davee Department of Neurology's Division of Movement Disorders, demonstrates the potential of utilizing DNA methylation as a biomarker and diagnostic tool for identifying disease risk in patients.

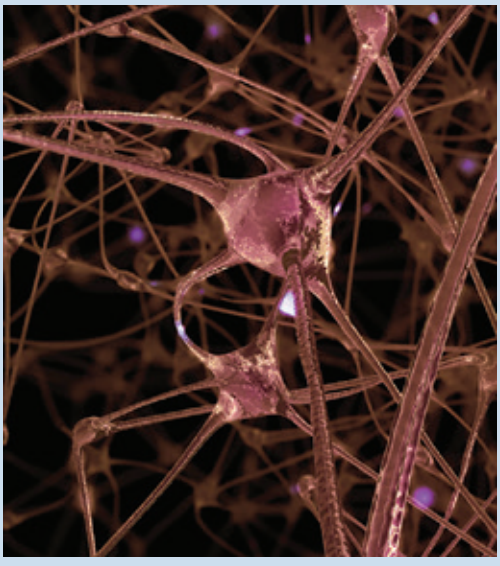
Parkinson's disease occurs when specific regions of the brain lose their ability to make dopamine and, ultimately, regulate movement. The condition impacts more than six million people worldwide, according to the Michael J. Fox Foundation for Parkinson's Research.

In addition to currently known genetic causes of Parkinson's, recent work has also suggested that environmental factors can increase one's risk of developing the disease. Understanding the impact of environmental exposures and genetic mutations on disease risk, however, has remained understudied.

In the current study, the investigators studied DNA methylation profiles from the blood samples of 196 patients with Parkinson's disease and 86 healthy controls enrolled in the Parkinson's Progression Markers Initiative (PPMI) study.

PPMI is funded by the Michael J. Fox Foundation for Parkinson's Research and funding partners. This work was also supported by a PPMI Early Investigator Award.

This work was supported by National Heart, Lung, and Blood Institute grants HL127646, HL140973, HL138982 and HL140927, and the Leducq Network.

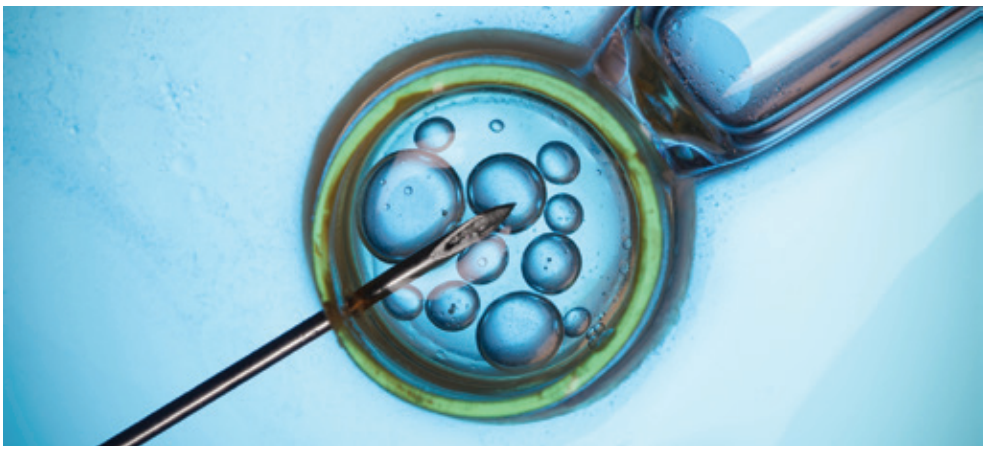


MEDIA SPOTLIGHT

U.S.News

Ultrasound Device Delivers Meds to Better Fight Brain Tumors

One of the biggest obstacles to treating brain cancer is getting tumor-killing drugs past the blood-brain barrier that normally protects the brain from foreign invaders. Now, new research shows that ultrasound waves emitted from a device implanted in a cancer patient's skull could be the key to getting chemotherapy and immunotherapy drugs into the brain. This ultrasound technology allowed physicians at Northwestern Medicine in Chicago to get a small dose of these drugs past the blood-brain barrier, according to a report published June 6 in the journal *Nature Communications*. What's more, the treatment boosted the immune system's recognition of brain cancer cells, according to investigators. "This is the first report in humans where an ultrasound device has been used to deliver drugs and antibodies to glioblastoma to change the immune system, so it can recognize and attack the brain cancer," says Adam Sonabend, MD, an associate professor of Neurological Surgery at Northwestern University Feinberg School of Medicine. "This could be a major advance for the treatment of glioblastoma, which has been a frustratingly difficult cancer to treat, in part due to poor penetration of circulating drugs and antibodies into the brain."



npr

The Science of IVF: What to Know About Alabama's 'Extrauterine Children' Ruling

An Alabama Supreme Court ruling that frozen embryos can be considered "extrauterine children" under state law has major implications for how in vitro fertilization, commonly called IVF, is performed. The ruling came in a wrongful death lawsuit brought by couples whose frozen embryos were destroyed in an accident at a fertility clinic in Mobile, Alabama. The court agreed with the couples that the embryos were protected under the state's Wrongful Death of a Minor Act. Legal and reproductive medicine experts say the ruling raises the risks and costs of IVF for both patients and medical practitioners. Each cycle of IVF is a multistep process that is keyed to a patient's menstrual cycle in the beginning. First, a patient needs to take injectable hormones every day for a 10- to 12-day period, explains Eve Feinberg, MD, associate professor in the Department of Obstetrics and Gynecology and a reproductive endocrinologist and infertility specialist at Northwestern University Feinberg School of Medicine. Those hormones prime multiple eggs to mature inside the ovary in little fluid-filled sacs called follicles. Patients are monitored regularly, often daily. Once those follicles reach a certain size, the patient takes a different hormone that gets the eggs ready to be retrieved. "By definition, 45 percent of all embryos grown in the laboratory 'die,'" Feinberg says. "And the charge of wrongful death can now be applied. As a reproductive specialist, that idea is terrifying. Who wants to assume that risk?"

TODAY

How This Longevity Lab Aims to Help Slow Down the Aging Process

A longevity lab in Chicago is researching new therapies and interventions to help understand and slow down the human aging process so that people can live longer, healthier lives. "If you want to think about potentially extending your lifespan, the right diet, exercise, healthy habits, avoiding high-risk activities. I wouldn't be surprised to learn that stress reduction might have impact on aging," says Douglas Vaughn, MD, director of the Potocsnak Longevity Institute and professor of Medicine at Northwestern University Feinberg School of Medicine. The goal of this institute is to study the aging of people with socioeconomic statuses, ethnicities, and disadvantages — ultimately learning how to extend these people's healthspan.

WEB EXTRA

Read more about Northwestern faculty's insights in the media.

FACULTY AWARDS & HONORS

Wayne N. Burton, MD, '77 GMER, clinical associate professor in the division of General Internal Medicine in the Department of Medicine, is the recipient of the 2024 Oregon Health Sciences School of Medicine Alumni Association's Esther Pohl Lovejoy Leadership Award. The award is named for Dr. Lovejoy, a graduate of the OHSU School of Medicine who played a significant role in public health reform. This award honors alumni of the medical school who have demonstrated exceptional leadership and service to the medical profession and contributed to systemic improvements in health outcomes. 1

Phyllis C. Zee, MD, PhD, '87 GMER, '89 GMEF, has been appointed as the new chair of the Research Advisory Committee for the American Brain Foundation. Zee is director of the Center for Circadian and Sleep Medicine Disorders, chief of Sleep Medicine in the Ken & Ruth Davee Department of Neurology, and the Benjamin and Virginia T. Boshes Professor of Neurology. 2

Wendy A, Beattie, '88 CPO, assistant professor of Physical Medicine and Rehabilitation at Northwestern University Feinberg School of Medicine, is the recipient of the Titus Ferguson Lifetime Achievement Award. One of the highest awards in the orthotics and prosthetics field, the Titus Ferguson Lifetime Achievement Award is "bestowed upon an outstanding academician whose accomplishments and contributions have made a significant impact on the growth and development of the profession." Beattie is the only woman to ever receive this award. 3

Brian Mustanski, PhD, director of the Institute for Sexual and Gender Minority Health and Wellbeing and Third Coast Center for AIDS Research (CFAR), interim chief of Implementation Science in the Department of Medical Social Sciences, and professor of Medical Social Sciences, Psychiatry and Behavioral Sciences, Psychology, and Infectious Diseases, has been appointed to the Advisory Committee to the Director of the National Institutes of Health, Monica M. Bertagnolli, MD. Mustanski was invited to join the committee by Xavier Becerra, secretary of the Department of Health and Human Services. Mustanski's appointment begins immediately and extends through 2027. 4

Chad A. Mirkin, PhD, has been awarded the 2024 Kavli Prize in Nanoscience by The Norwegian Academy of Science and Letters. Mirkin is the first Northwestern University scientist to receive the prestigious award. Mirkin is recognized for his discovery of spherical nucleic acids (SNAs), nanostructures comprised of a nanoparticle core and a shell of radially distributed DNA or RNA strands. 5

Yogesh Goyal, PhD, assistant professor of Cell and Developmental Biology and assistant professor at Northwestern University McCormick School of Engineering, has been named a Pew-Stewart Scholar in Cancer Research, 6 and **Ann Kennedy, PhD**, assistant professor of Neuroscience, has been named a Pew Scholar in the Biomedical Sciences. The Pew-Stewart Scholars Program for Cancer Research is a national initiative designed to support promising early career scientists whose research will accelerate discovery and advance progress to a cure for cancer. The Pew Scholars Program in the Biomedical Sciences provides funding to young investigators of outstanding promise in science relevant to the advancement of human health. 7

Alan Hauser, MD, PhD, vice chair of the Department of Microbiology-Immunology and professor of Microbiology-Immunology and Medicine in the Division of Infectious Diseases, 8 and **Scott Budinger, MD**, chief of Pulmonary and Critical Care in the Division of Medicine, the Ernest S. Bazley Professor of Airway Diseases, and professor of Medicine in the Division of Pulmonary and Critical Care and Cell and Developmental Biology, have been awarded the Mentor of the Year Award by Feinberg's Medical Faculty Council. Hauser and Budinger will be recognized for their awards at the 2024 Lewis Landsberg Research Day in September. 9

Susan Quaggin, MD, the Irving S. Cutter Professor and chair of Medicine and director of the Feinberg Cardiovascular and Renal Research Institute is the winner of the American Society of Nephrology's 2024 John P. Peters Award. Named after one of the founders of the field of nephrology, this prestigious award recognizes individuals who have made substantial research contributions to the discipline of nephrology and have sustained achievements in one or more domains of academic medicine including clinical care, education, and leadership. (*Read more about Quaggin, her work, and what she hopes to achieve as the new chair of Medicine in the article* Creating Positive Change and Putting Patients First *on page 26.*) 10

‘Father of Microbiome Research’ Awarded 2024 Nemmers Prize in Medical Science

Jeffrey Gordon, MD, a professor at Washington University in St. Louis, who is often referred to as the “father of microbiome research,” is the recipient of the 2024 Mechthild Esser Nemmers Prize in Medical Science at Northwestern University.

The Mechthild Esser Nemmers Prize in Medical Science, which carries a $350,000 stipend, is given to a physician-scientist whose body of research exhibits outstanding achievement in their discipline as demonstrated by works of lasting significance. Gordon was selected by a jury of distinguished scientists from across the country.

Gordon, who is the Dr. Robert J. Glaser Distinguished University Professor and Director of The Edison Family Center for Genome Sciences and Systems Biology at Washington University School of Medicine in St. Louis, has led research which has transformed the understanding of human health and how it is shaped by the gut microbiome.

Trailblazing Biochemist Delivers Kimberly Prize Lecture

Influential biochemist Craig M. Crews, PhD, who pioneered the pharmaceutical field of targeted protein degradation, delivered the second Kimberly Prize in Biochemistry and Molecular Genetics Lecture to a full auditorium of Feinberg faculty, staff, fellows, and students on April 15.

Crews, the John C. Malone Professor of Molecular, Cellular and Developmental Biology and a professor of Chemistry, Pharmacology, and Management at Yale University, was selected to receive the prize for leading the development of the anti-cancer drug carfilzomib (Kyprolis) used in the treatment of relapsed or refractory multiple myeloma.

Crews also spearheaded the development of PROTAC (proteolysis-targeting chimeras) drugs, which use heterobifunctional molecules — molecular homing devices fused to cellular protein adapters — to target specific proteins for destruction by the cell’s proteasome. Crews is credited with bringing PROTAC-based drugs into clinical trials, which could be used to treat an array of human diseases, including cancer.

Celebrating Graduation 2024

Lena Volpe, '24 MD, addressed her classmates and stressed the importance of a physician's relationship with their patients.

Michael Brown, MD, director of the Jonsson Center for Molecular Genetics and regental professor at the University of Texas, Southwestern Medical School delivered this year's commencement address (top). MD Class of 2024 graduates celebrate at Chicago's Navy Pier (bottom).

Feinberg honored the MD Class of 2024 during the medical school's 165th commencement ceremony held in the Aon Grand Ballroom at Navy Pier on May 13.

This year's commencement began with remarks from Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean, who welcomed graduating medical students, faculty, family, and friends to the ceremony.

"As I reflect on the extraordinary things you've accomplished so far, I'm reminded you're also embarking on a new stage of life as students of medicine," Neilson says. "This stage is more personal and reflective, where you quickly become your own teacher and set goals for what you will remember and refresh through your years of continuing medical education."

Northwestern University Provost Kathleen Hagerty, PhD, MBA, welcomed the new graduates to the Northwestern Alumni community.

"As Northwestern graduates, you join a vibrant and diverse community of alums at the forefront of their fields in the arts, sciences, business, engineering, law, and of course, medicine," Hagerty states. "I am grateful for your contributions to the Northwestern community."

Michael Brown, MD, director of the Jonsson Center for Molecular Genetics and Regental Professor at the University of Texas, Southwestern Medical School, delivered this year's commencement address, congratulating the graduates for persevering despite starting medical school during a pandemic.

"The Feinberg Medical School class of 2024 entered at the peak of a devastating pandemic," Brown says. "Medical schools were under immense pressure. Desperate faculty were faced with hundreds of dying patients while trying to figure out the best treatments by trial and error. Medical students were faced with shuttered classrooms, canceled classes, and education by Zoom. Somehow, the Class of 2024 survived. You overcame these obstacles. You learned medicine. And now you're poised to take the next step in your quest to become physicians."

Lena Volpe, '24 MD, addressed her classmates and stressed the importance of a physician's relationship with their patients.

"There's a fundamental truth that lies at the heart of our profession: To be cared for is to be known," says Volpe, who will return to Northwestern in the fall for her residency in Obstetrics-Gynecology at McGaw Medical Center. "To truly care for our patients, we must strive to know them. Not just their symptoms, lab values, and diagnoses, but the fullness of their reality."

WEB EXTRA
View highlights from the 2024 MD Commencement.

PHOTOGRAPHY BY *Nathan Mandell*

TURNING BACK THE CLOCK

A new longitudinal study within the Human Longevity Laboratory investigates aging, with the ultimate goal of finding ways to reverse its negative effects.

BY EMILY AYSHFORD

Some physical aspects of aging seem unavoidable: eyesight worsens, hearing degrades, and gaits slow.

But other indicators are hidden — DNA methylation biomarkers change, for example, while the sugar structures circulating within our blood shift to become abnormal. Other more elusive clues can only be found when scientists or artificial intelligence (AI) programs analyze test results, like EKGs, for signs of aging.

Today, scientists can use data and testing to determine a person's "biological age" rather than chronological age, and potentially leverage interventions to slow or even reverse aging.

By investigating the relationship between chronological age and biological age across different organ systems, faculty at the new Human Longevity Laboratory at Northwestern University Feinberg School of Medicine aim to provide knowledge and insight to help scientists develop methods to extend the human lifespan.

As part of Feinberg's Potocsnak Longevity Institute, a team led by Douglas Vaughan, MD, director of Potocsnak Longevity Institute, has launched a longitudinal, cross-sectional study to investigate aging across different organ systems. The team will then use that information to test interventions that might reverse or slow down the process of aging.

"The biology of aging is rapidly becoming demystified," says Vaughan, who also serves as the Irving S. Cutter Professor of Medicine Emeritus. "And our ability to measure biological age is real. We're in a unique moment in human history where we might be able to do something about aging and ensure that everyone has a better chance at a healthier life."

AN ARRAY OF TESTS THAT DETERMINE BIOLOGICAL AGE

In fact, the goal of the lab is not to extend life span. It aims to extend "health span" — the length of time that a person is healthy — especially for people who are disadvantaged from an aging standpoint. ▸

A comprehensive research protocol at the Human Longevity Laboratory includes assessments across various systems (cardiovascular, respiratory, neurocognitive, metabolic, and musculoskeletal), and novel molecular profiling of the epigenome. Photo by Shane Collins.

Established in 2022, the Potocsnak Longevity Institute, which includes the Human Longevity Lab (HLL), is a pioneering initiative that delves into the science of aging through various specialized centers. Photo by Teresa Crawford.

That includes people who have a higher burden of exposure to adverse social determinants of health and people living with chronic HIV infections.

But first, faculty must understand aging across a wide variety of the population. To do so, the lab is recruiting and enrolling up to 500 participants over the next year to undergo a variety of aging tests. These include tests of physiological function, including hearing and smell tests, and measures of physical ability, such as grip strength tests and gait assessments. Participants even get their turn in a futuristic-looking capsule called the BodPod, which measures the ratio of their body's fatty mass to lean mass.

Cardiovascular health is measured through EKGs and heart-rate tests, as well as through retinal imaging, where the health of blood vessels can be studied. Finally, participants have their biological age measured through DNA methylation, a measure of modifications in their DNA. When compounds called methyl groups attach to DNA in certain locations, it can be a biomarker of accelerated aging.

Participants are given a report on their overall biological age, but one number might not reveal everything. Aging can differ across a person's organ systems, and it may well vary over short timespans.

And not all measures are created equal — as investigators continue the study, they hope to eliminate measurements that aren't as relevant to aging and bring on new tools that could offer more insight.

"WE'RE IN A UNIQUE MOMENT IN HUMAN HISTORY WHERE WE MIGHT BE ABLE TO DO SOMETHING ABOUT AGING AND ENSURE THAT EVERYONE HAS A BETTER CHANCE AT A HEALTHIER LIFE."

DOUGLAS VAUGHAN, MD

HARNESSING THE POWER OF AI

One of those tools is AI, overseen at the lab by Baljash Cheema, '15 MD, '20 MSCI, '22 MSAI, assistant professor of Medicine and transplant cardiologist at Northwestern Medicine. Cheema is a cardiologist who also has a Master of Science in AI degree from Northwestern University McCormick School of Engineering. He is keen on using machine learning technology in medicine.

"AI is really good at specific tasks, like looking at 10 million echocardiograms and predicting one parameter," he says. "So we wanted to incorporate this ability into the study of aging."

Currently, the lab has integrated AI tools already available on the market. Faculty work with a group in Brazil that has trained an AI model to predict someone's age based on their EKG results. "What's fascinating is that if the AI model predicts that you're older than you actually are, that corresponds with you having some degree of cardiovascular risk," Cheema says.

The team also works with a group in New Zealand that has trained an AI model to predict someone's age based on retinal images. Because it is the only place

> **"WHAT'S FASCINATING IS THAT IF THE AI MODEL PREDICTS THAT YOU'RE OLDER THAN YOU ACTUALLY ARE, THAT CORRESPONDS WITH YOU HAVING SOME DEGREE OF CARDIOVASCULAR RISK."**
>
> BALJASH CHEEMA, MD, MSCI, MSAI

where physicians can image blood vessels, it provides information on blood vessels' width and twist. "That's another window into cardiovascular health," Cheema says.

Another AI collaboration lies closer to home. To analyze the speed and movement of a participant's gait, the lab works with James Cotton, MD, PhD, assistant professor of Physical Medicine and Rehabilitation and a physician at Shirley Ryan AbilityLab. Cotton's AI tech analyzes joint movement, speed, and quality of walking, and compares it to that of people around the same age, offering a muscular-skeleton component of biological age.

In fact, almost all of the lab's tests have some AI aspect built into them. "I think AI will be a big driver in what we learn," Vaughan says. "And when we have a great dataset of participants of all different ages, we can use AI to analyze that to give us a multidimensional composite of biological age."

IDENTIFYING INTERVENTIONS THAT WORK

The lab's first year will focus on measuring how much aging varies across people, organ systems, and time. (Some participants will be invited back to be reassessed after a few months just to check how time affects the aging process.)

Then, lab members hope to quickly pivot to testing interventions that could potentially slow or reverse aging. That will involve recruiting participants into randomized controlled trials to test therapies like metformin, which helps control blood sugar and has been shown to potentially slow aging. Trials could also include lifestyle changes, such as intermittent fasting, caloric restriction, and even meditation.

"There is a lot of misinformation out there on what slows aging," Vaughan says. "We want to start with a healthy dose of skepticism that anything works. We are going to be the lab that tests these interventions rigorously and without bias."

The ultimate goal is to "bend the curve" of aging, says John Wilkins, MD, '11 MSCI, associate director of the Human Longevity Lab and associate professor of Medicine and of Preventative Medicine. "We're going to test interventions that have already been proved to be safe and effective," he says. "We don't yet know which will work the best, but science isn't fun when you know the answer. If we find an answer, it will help people live healthier, longer lives — particularly those who are disadvantaged. We want them to live the longest, healthiest life possible."

The Human Longevity Lab aims to conduct multidimensional phenotyping to measure biological age in participants. Photo by Teresa Crawford.

CREATING A GLOBAL NETWORK

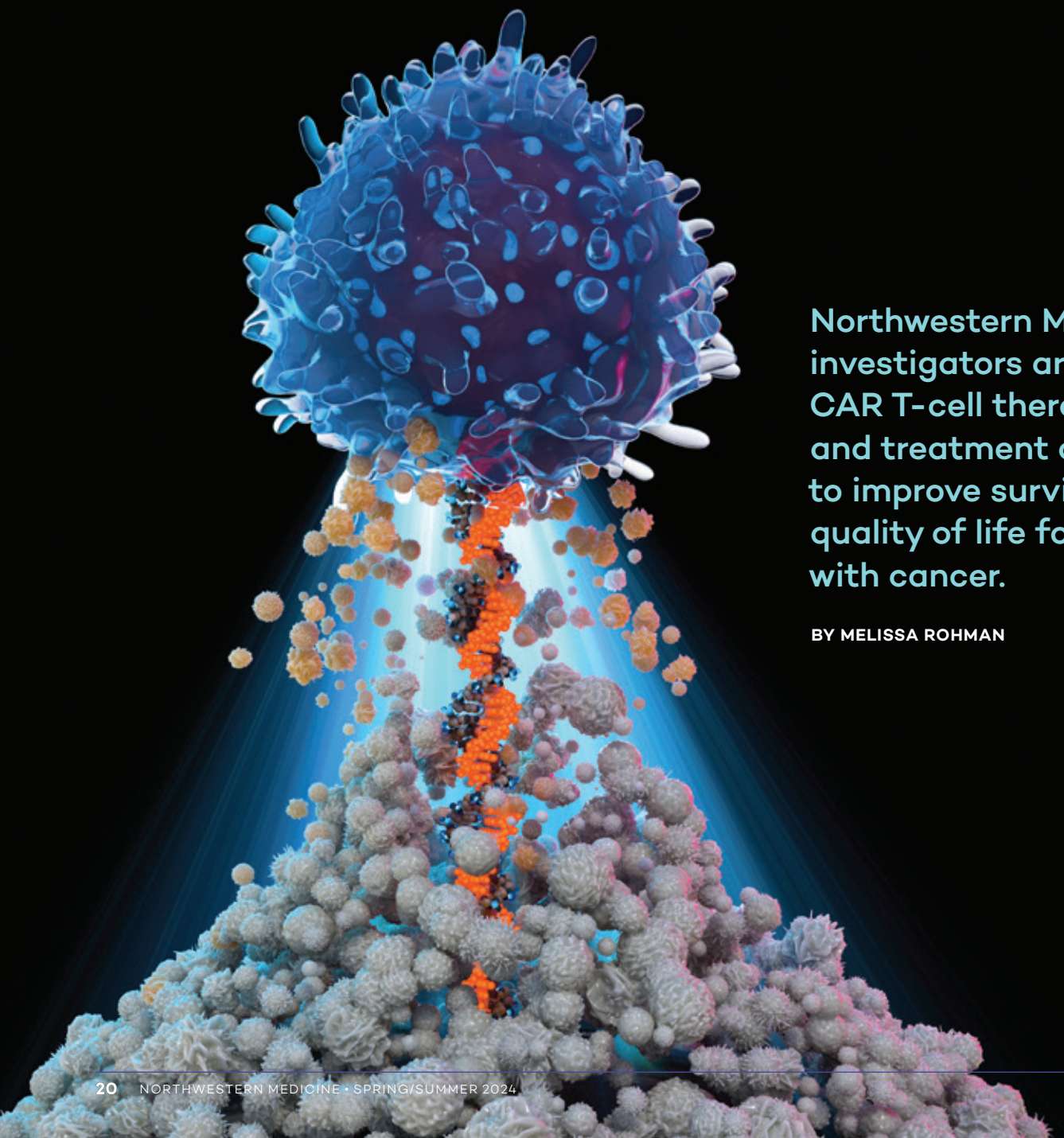
Though the lab hopes to get a database of hundreds of participants in the Chicago area, faculty do not want to stop there. Lab leadership is already in talks with research groups around the world to create a network of similar labs, with Northwestern as the flagship site. Potential sites have already been identified in Asia, South America, Europe, and Africa.

A global network would allow more data collection and more testing, especially among a wide variety of populations.

"What differentiates the Human Longevity Lab is our dedication to multifactorial measurement of aging," Vaughan says. "It's our use of artificial intelligence, and our talented, thoughtful faculty who bring their expertise to the table. We have the ability to bring this all together and hopefully increase the health span for many people." ❖

Over the coming year, HLL will enroll a diverse cross-sectional cohort representing individuals of all ages, ethnicities, and socioeconomic backgrounds. The data from this cohort will be leveraged to develop AI-based tools aimed at identifying the markers of healthy aging. Photos by Shane Collins.

MAXIMIZING THE POWER OF T-CELLS



Northwestern Medicine investigators are steering CAR T-cell therapy research and treatment development to improve survival and quality of life for patients with cancer.

BY MELISSA ROHMAN

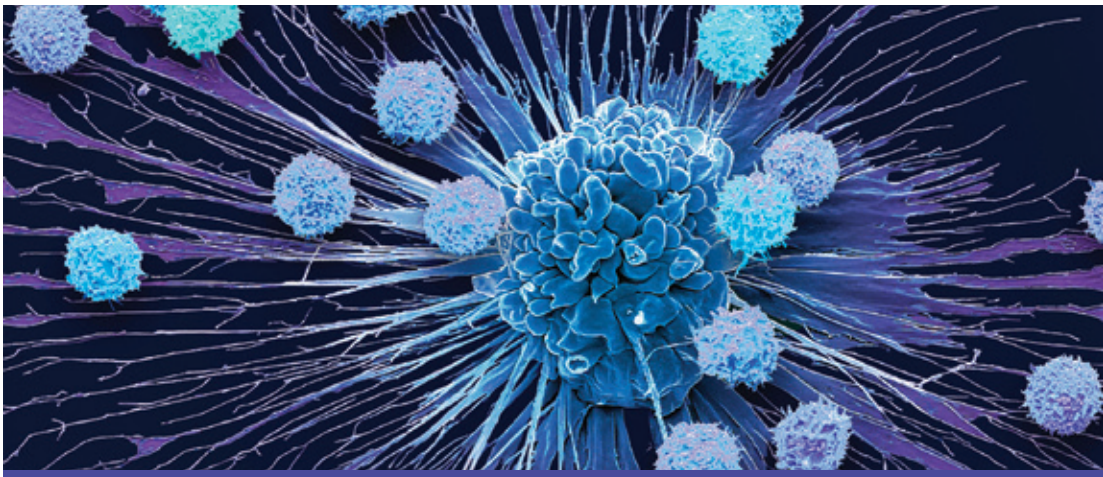
In 1988, scientists led by Steven A. Rosenberg, MD, PhD, chief of Surgery at the National Cancer Institute, developed a new immunotherapy involving tumor infiltrating lymphocytes in which white blood cells were taken directly from a patient's tumor, grown in large numbers in a lab, and then given back to the patient. The novel therapy, detailed in a breakthrough study published then in *The New England Journal of Medicine*, showed for the first time how this innovative approach could effectively target and fight cancer.

This discovery would ultimately lay the groundwork for the development of many present-day immunotherapies, including CAR T-cell therapies, and ultimately inspire the establishment of robust CAR T-cell therapy research and clinical programs, such as the program at Northwestern Medicine.

Today, CAR T-cell therapy is most used to treat lymphomas — cancers that form in the lymphatic system — including diffuse large B-cell lymphoma, an aggressive form of B-cell lymphoma. CAR T-cell therapy is also used to treat multiple myeloma, a cancer of plasma cells, and acute lymphoblastic leukemia (ALL), in which bone marrow produces too many lymphocytes and can spread to other organs.

In 2017, the FDA approved the first CAR T-cell therapy, tisagenlecleucel, for the treatment of pediatric and adult ALL. There are now a number of CAR T-cell therapies approved by the FDA for the treatment of blood cancers — approvals which, in large part, have been made possible by the work of Northwestern Medicine's CAR T-cell Therapy Program. The initial clinical trials of CAR T-cell therapy in lymphoma were led by Leo Gordon, MD, the Abby and John Friend Professor of Oncology Research and professor of Medicine in the Division of Hematology and Oncology, and Reem Karmali, MD, MS, associate professor of Medicine in the Division of Hematology and Oncology.

The goal of the CAR T-cell therapy program is to use innovative therapies and treatment strategies, which include CAR T-cell therapy, to treat and ultimately cure people diagnosed with blood cancers, including lymphomas.



"EVERYTHING THAT WE DO SHOULD BE AND IS GEARED TOWARDS IMPROVING OUTCOMES FOR PATIENTS, BE IT LIFESPAN OR SIDE EFFECTS OR QUALITY OF LIFE."

REEM KARMALI, MD, MS

"The goals of the program are to think outside the box and use treatments that can better target the biology of the cancer and impact the overall survival of patients," Karmali says. "Everything that we do should be and is geared towards improving outcomes for patients, be it lifespan or side effects or quality of life."

With expanded research across the Northwestern Medicine system, the program provides robust clinical care and leads various clinical trials studying next generation CAR T-cell therapies. In addition, it is integrated with Ann & Robert H. Lurie Children's Hospital of Chicago, where CAR T-cell therapy is administered to pediatric patients with B-acute lymphoblastic leukemia. The Northwestern Medicine Sarcoma Program, led by Seth Pollack, MD, the Steven T. Rosen, MD, Professor of Cancer Biology and associate professor of Medicine in Hematology and Oncology, is also testing CAR T-cell therapies in patients with sarcoma.

"Where we are today in terms of availability to patients is because of some of the work that Northwestern has done and participated in terms of clinical trials," Karmali affirms.

MOVING TO THE FRONT LINE

The standard of care for patients with B-cell lymphoma includes chemoimmunotherapy, which is currently effective in only 60 percent of patients, according to Karmali. In the other 40 percent of patients, cancer recurrence will occur, and patients will need a stem cell or bone marrow transplant. The treatment, however, is toxic and not all patients will respond well to treatment.

"For many people, often the goal was to really just control the disease as best as we could, but not really achieve a cure," Karmali says.

Enter CAR T-cell therapy. For patients who didn't qualify for a stem cell transplant, Northwestern-led clinical trials allowed many of these patients to undergo CAR T-cell therapy in lieu of a stem cell transplant, extending patient survival and curing many patients, according to Karmali. ▸

Jaehyuk Choi, MD, PhD, associate professor of Dermatology and of Biochemistry and Molecular Genetics, and Jay Daniels, Medical Scientist Training Program (MSTP) student, have leveraged cancer's roadmap to identify ways to supercharge T-cells to treat otherwise deadly solid tumors. Photo by Olivia Dimmer.

Thanks to additional clinical trials, CAR T-cell therapy is now the standard of care for patients with recurrent cancer who don't respond to first-line chemoimmunotherapy. "CAR T and other cellular therapies may in fact one day replace stem cell transplant in lymphoma, myeloma, and certain leukemias," Gordon explains. "We are not there yet, but CAR T therapy and other cellular therapies are a more targeted form of allogeneic stem cell transplant, which in fact is the 'first' cellular therapy."

TARGETING SOLID TUMORS

While CAR T-cell therapy has proved effective in patients with hematologic cancers, it currently remains ineffective in treating solid tumors. The reasons why are not yet clear, however possible answers loom within the field, according to Leonidas Platanias, MD, PhD, director of Robert H. Lurie Comprehensive Cancer Center, Jesse, Sara, Andrew, Abigail, Benjamin and Elizabeth Lurie Professor of Oncology, and professor of Medicine.

"For myeloid tumors it's because there are what we call myeloid suppressor cells — cells that suppress in the environment of some myeloid cells. In solid tumors, it's a little different and that may be that the cells don't get access within the tumor," Platanias says.

A recent breakthrough study led by Jaehyuk Choi, MD, PhD, associate professor of Dermatology and of Biochemistry and Molecular Genetics, found that inserting a gene encoding a unique mutation in T-cells that cause lymphoma into normal human T-cells made them 100 times more potent at killing cancer cells without any indication of becoming toxic.

A collaboration between Northwestern and the University of California San Francisco (UCSF), the study published in *Nature* demonstrated that the engineered T-cells were able to kill tumors derived from skin, lung, and stomach in mice, suggesting a potential strategy for effectively targeting solid tumors without added toxicity.

"We used nature's roadmap to make better T-cell therapies," Choi says. "The superpower that makes cancer cells so strong can be transferred into T-cell therapies to make them powerful enough to eliminate what were once incurable cancers."

TACKLING CHALLENGES AND LOOKING AHEAD

Karmali is currently leading clinical trials that aim to determine whether CAR T-cell therapy is more effective than standard chemoimmunotherapy in high-risk patients as first-line treatment. Other ongoing research efforts involve using novel CAR T products that target different proteins on the cell surface.

"We may be heading towards a one-and-done treatment that's much quicker, that's perhaps more effective, and in some instances even better tolerated than six cycles of intensive chemoimmunotherapy," Karmali states. Positive outcomes with CAR T-cell therapy are also dependent on patient accessibility, especially for patients living in rural and underserved areas, and patient education, Karmali emphasizes.

"There are some unique side effects associated with CAR T, and so one really needs to be accustomed to recognizing and dealing with these side effects, and that really only comes with being in it and dealing with these constructs," Karmali says.

Side effects typically occur within the first two weeks of receiving CAR T-cell therapy and can include cytokine release syndrome — an inflammatory syndrome characterized by fever and multiple organ dysfunction — and immune effector cell associated neurologic syndrome, or ICANS, which can cause tremors, aphasia, confusion, and, in some cases, seizures. In January, the FDA also issued a call to add a class-wide boxed warning to six commercially available CAR T therapies to inform patients and providers of their potential risk of secondary T-cell malignancies.

Nevertheless, Karmali says it's important to affirm to patients that "the risk is worth the reward" in terms of pursuing the therapy and figuring out how to get to and be near their chosen medical institution to receive continuous care and observation.

Patient accessibility is also key to having more diverse clinical trials and improving health equity, Karmali maintains.

"A lot of what we're trying to move towards is really improving accessibility and the diversity of patients that are included in our studies so that we have a better sense of how we can use this type of therapeutic in a more diverse population that's more representative of the U.S.," she says.

In addition to robust clinical programs and clinical care, the development of advanced molecular technologies in the last few decades has established a bright future for CAR T-cell therapy research and therapeutic development.

"We now have very sophisticated molecular techniques and capacity to do many more things using modern molecular biology and bioengineering, which is something that Northwestern likes to do," Platanias says. "So hopefully we will see major breakthroughs in the future and much more impactful outcomes." ❖

WEB EXTRA

Listen to Choi discuss how a gene mutation found in T-cells of patients with lymphoma could hold the key to a potent cancer-fighting immuno-therapy for solid tumor cancers.

Northwestern physicians mark a milestone in transplantation as they reach their 10,000th transabdominal transplant surgery.

BY OLIVIA DIMMER

10,000 TRANSPLANTS AND COUNTING

USHERING IN A NEW ERA IN TRANSPLANTATION

The 10,000th abdominal organ transplant milestone follows a record-breaking year of abdominal transplants at the Organ Transplantation Center, totaling 518 kidney, liver, and pancreas transplants in 2023. Founded in 1964, the Organ Transplant Center is one of the largest and longest running in Illinois.

When the anesthesia mask went over Joe Tkac's face in the operating room, he cried.

But he wasn't scared, he says — they were tears of joy.

"It was joy. Like, 'I can't believe this is finally happening,'" the 23-year-old says of his kidney-pancreas transplant at Northwestern Memorial Hospital in December 2023. "I had all my faith in the doctors, and I was just like, 'This is gonna work out. It's all good.'"

Tkac's transplant marks a monumental milestone for the Organ Transplant Center at Northwestern Memorial Hospital as it is the 10,000th completed abdominal organ transplant surgery performed at the hospital.

"It's been a few months out since my surgery, and it hasn't hit me a hundred percent," Tkac says. "The best way I can describe it is just surreal, really. It was a surreal emotional rollercoaster." Born a month premature with kidney dysplasia, Tkac had undergone two kidney transplants already. After side effects from medication left him diabetic, Tkac had hoped that a kidney-pancreas transplant would free him from the dialysis and insulin injections that had quickly taken over his life.

After getting his hopes up on three separate occasions when organs became available but ultimately ended up not being a good match for him, Tkac wasn't sure it was going to happen this time around. But then it did, and now he is one of the 10,000 abdominal transplant recipients who have been treated at Northwestern Memorial Hospital since the hospital started providing transplant services in 1964.

With its commitment to advancing transplantation science, what started as a relatively small program in the '60s has grown to be one of the largest in the country, and with the establishment of projects like community-based outreach programs to encourage organ donation, the hospital's organ transplant program is positioned for even more growth.

"This was a small kidney program until the 1990s, and then it grew to become one of the most comprehensive multi-organ abdominal transplant programs in the country. You don't get to that number of patients without taking on challenging cases, being innovative, and developing new techniques and therapies," says Joseph Leventhal, MD, PhD, the Fowler McCormick Professor of Surgery in the Division of Organ Transplantation and former interim chief of Organ Transplantation in the Department of Surgery.

"THE FACT THAT WE'VE HIT 10,000 NOT ONLY ALLOWS US THE OPPORTUNITY TO SAY WE'VE SAVED MORE LIVES THAN MANY TRANSPLANT PROGRAMS IN THE COUNTRY, BUT ALSO GIVES US THE EXPERIENCE TO BE ON THE FOREFRONT OF THE NEXT ERA OF TRANSPLANT SCIENCE."

SATISH NADIG, MD, PHD

A TRANSPLANT RENAISSANCE

According to 2023 data from the United Network for Organ Sharing, Northwestern Medicine's organ transplant program is seventh in the U.S. for the highest number of kidney transplants performed and third for kidney/pancreas transplants.

"We're really in a renaissance of transplant right now. It's exciting to see where transplantation was, and more importantly, where it is going," says Satish Nadig, MD, PhD, director of the Comprehensive Transplant Center (CTC) at Northwestern University Feinberg School of Medicine, chief of Organ Transplantation in the Department of Surgery, Edward G. Elcock Professor of Surgical Research, and professor of Microbiology-Immunology and Pediatrics. "The fact that we've hit 10,000 not only allows us the opportunity to say we've saved more lives than many transplant programs in the country, but also gives us the experience to be on the forefront of the next era of transplant science."

Following a series of pivotal hires in the '90s, the Organ Transplant Center paved the way for the program to grow, says Leventhal, who has been with the center since then.

With more surgeons, the program then added an important research arm: the CTC. Founded in 2009, the center aims to accelerate research around organ transplantation and other care for end-stage organ disease.

Nadig, who directs the center, says the organ transplant program has benefitted from early adoption of technological advancements such as machine profusion for livers, a technique in which a machine helps preserve a liver outside of the body for up to 24 hours.

Northwestern's approach also helped to identify biomarkers for detecting organ rejection and the use of tolerance induction strategies to help patients off anti-rejection medications, Nadig says.

In the near future, Nadig and his colleagues have their sights on applying robotics and nano therapeutics to transplantation.

"We are on the forefront, and that is not only recognized internally, it's recognized and externally validated by our program having more NIH (National Institutes of Health) funding than the large majority of programs across the country," Nadig asserts. "We are the second highest in research funding amongst

PHOTOGRAPHY BY *Teresa Crawford*

the five largest volume programs in the country. Not only are we doing a lot of transplants, we're investing in how we do it differently."

The hospital's transplant program was the first in the U.S. to utilize laparoscopic surgery in living donor kidney transplant surgery and the first to utilize novel induction antibodies to help wean patients off steroids, Leventhal adds.

"As we embrace novel techniques in transplantation such as robotics and developing new cellular therapies and nano therapeutics, we look forward to continuing our legacy of being the place where important bench-to-bedside translations take place," Leventhal says.

In addition to scientific advances, the program also aims to make a cultural impact. With the launch of the Northwestern Medicine Hispanic Transplant Program, the first of its kind in the country, Spanish speakers have dedicated bilingual, culturally competent care teams to help in their transplant journey.

In 2019, the hospital founded the African American Transplant Access Program, led by Dinee C. Simpson, MD, associate professor of Surgery in the Division of Organ Transplantation and the first Black transplant surgeon in Illinois. The African American Transplant Access Program aims to address distrust in the healthcare system and boost health literacy — two important issues that can drastically affect patient outcomes.

According to Leventhal and Nadig, more innovations are en route with the utilization of ex vivo organ conditioning. By using machinery to improve the health of organs outside the body, clinicians may be able to match more patients with organs or even rehabilitate a person's own organ.

"We're not just keeping up, we're leading the charge," Leventhal says. "We are actively pursuing extramural funding, philanthropic funding, and research initiatives to routinely question the status quo. So much of what allows us to get into the next era of transplant is of our own doing and creating those opportunities."

PATIENTS MAKING AN IMPACT

Brad Szczecinski landed in the emergency department a day after he helped his volleyball team win a tournament. Following the victory, Szczecinski started having vision problems. After visiting with a few physicians, he was given the diagnosis: end-stage renal disease.

"I was in denial about it," Szczecinski says. "I reached out to other medical providers to see if there was a solution or a workaround, but a few months later I found myself having to go on dialysis."

His kidney function and eyesight worsened, and Szczecinski dropped 60 pounds in under a year. When a new acquaintance from church offered to be his kidney donor and was found to be a match, Szczecinski knew he couldn't wait any longer and that transplant surgery was inevitable.

That experience stayed with Szczecinski his whole life, he says, along with his friendship with his organ donor. Now, Szczecinski is part of Transplant Village, a group of organ recipients, donors, and their families who have had experiences with Northwestern Medicine's Comprehensive Transplant Center and now volunteer their time to support the center and its research.

Szczecinski and his fellow Transplant Village volunteers worked alongside the Northwestern Memorial Foundation to fundraise for research and expanded care access. The endowment now sits near $15 million thanks to their combined efforts.

"If I can help another patient or provide them and their families some hope, I do that," Szczecinski says. "I also talk to folks about becoming a donor, either putting it on your driver's license for when you pass away or donating a kidney or part of your liver to save someone's life. We all have the ability to do that or potentially start an organ donation chain that saves multiple lives."

The hospital couldn't have reached 10,000 successful surgeries without the support of communities and patients like Szczecinski, Nadig says.

"We don't survive as a medical field unless folks are organ donors either in life or in passing. We are much more engaged with the community than many medical fields out there because we're reliant on the community in order to offer organ transplants," Nadig says. "Community engagement is extremely important for us, not only to hit this milestone, but also to hit the next 10,000." ❖

WEB EXTRA

Discover more about organ transplantation at Northwestern Medicine.

Transplant patient Brad Szczecinski (left) with his physicians Satish Nadig, MD, PhD, (right) and Joseph Leventhal, MD, PhD (center).


#850challenge

Susan Quaggin, MD, newly appointed chair of the Department of Medicine, focuses on advancing medicine by enhancing patient care and health equity.

CREATING POSITIVE CHANGE AND PUTTING PATIENTS FIRST

BY CHERYL SOOHOO

Susan Quaggin, MD, has always had a positive outlook on life. Even during the worst of times of the COVID-19 pandemic, this nephrologist found positive aspects as she and her Feinberg School of Medicine colleagues quickly came together to save lives.

While the clinicians at Northwestern Medicine shouldered a major portion of the burden of caring for the critically ill in hospitals and clinics during the height of the global health crisis, the Department of Medicine at Feinberg also provided support in other areas. The impact the deadly virus had (and continues to have) on many different parts of the body — from the lungs, heart, and kidneys to the GI system — required medical expertise from a variety of medical specialists. And as the largest department with 12 internal medicine divisions and more than 900 full- and part-time faculty, 350 trainees, and 650 staff members, the Department of Medicine at Feinberg played a significant role in advancing the research and science of the virus.

"I was struck by how everyone in our department and at Northwestern Medicine supported each other to make things happen and get things done for patients when the pandemic hit," Quaggin says. "It was an incredible time of unity and camaraderie during what felt like, at times, the Wild West. It showed me that we have an opportunity — and the ability — to make rapid and effective changes that will shape the future of healthcare and medicine."

Now, Quaggin plans to seize upon this new post-pandemic moment as the new chair of the Department of Medicine. The first woman to serve in this role at Northwestern University, she builds on her previous leadership position as the chief of the Division of Nephrology and Hypertension. She follows former chair, Douglas E. Vaughan, MD, who announced his intention to step down last summer after 15 years of distinguished leadership. In her new role, Quaggin looks forward to taking the department into the next era of medicine — one that will strengthen the delivery of equitable care and the promotion of health justice beyond the single patient to communities at large.

"We demonstrated how well we could help patients during the pandemic; imagine what we can do during non-crisis times." says Quaggin, who is also the Irving S. Cutter Professor of Medicine and physician-in-chief at Northwestern Memorial Hospital and Northwestern Medical Group. In addition, Quaggin remains director of the Feinberg Cardiovascular and Renal Research Institute. "We have the expertise, talent, and commitment to step out in front and lead all the positive changes currently taking place in healthcare nationally and globally."

FROM NORTH TO SOUTH

Quaggin decided to pursue a career in medicine during high school when she was introduced to the profession by the father of her boyfriend (now husband). Inspired by her future father-in-law, who had a passion for caring for his patients, the Montreal-born and Toronto-raised Quaggin decided to follow in his footsteps.

"Doc, as everyone called him, was really the reason I became a physician," she says.

At the University of Toronto, Quaggin completed medical school and then residency training in internal medicine. Her first official leadership role in the healthcare field came in 1991 when she served as chief medical resident at St. Michael's Hospital, a University of Toronto teaching affiliate. A fellowship in clinical nephrology followed at her alma mater. After honing her clinical acumen, Quaggin looked to build her science skills. "Better addressing patient health issues for me came down to knowing more about the causes of disease and their molecular underpinnings," she says. "Uprooting my family with our first child, a newborn baby girl, in tow, we moved to the States where I could learn the molecular biology of kidney development at Yale." In 1993, she started a postdoctoral fellowship in the Ivy League research laboratory of Peter Igarashi, MD, now the dean of the Renaissance School of Medicine at Stony Brook University. In the ▸

PHOTOGRAPHY BY *Gr8y Productions*

Igarashi lab, Quaggin began to understand the role of transcription factor action and fundamental genetic pathways essential to healthy kidney development and function.

Three years later, Quaggin returned to the University of Toronto, where she completed a second postdoctoral fellowship in mouse genetics in the lab of noted developmental biologist and stem cell pioneer Janet Rossant, PhD, in 1998. Following the traditional academic medicine path, Quaggin developed her own independent lab, successfully competed for grants, and began conducting novel studies in the area of kidney and vascular health. All the while, she also worked to establish her clinical practice to help patients with kidney conditions.

An increasingly accomplished physician-scientist, Quaggin was soon elected to take on prominent leadership roles with groups such as the American Society of Clinical Investigation and International Society of Nephrology. In 2011, she was appointed deputy editor of the *Journal of the American Society of Nephrology* where she worked closely with Eric G. Neilson, MD, vice president for medical affairs and Lewis Landsberg Dean. By that time, as her career trajectory rose, Quaggin had built a valued friendship with Neilson as their paths crossed at conferences and presentations around the world. "A great mentor for many people, he has been a wonderful sounding board and advisor for me," she says.

Meanwhile back in Toronto, Quaggin and her spouse, Kevin Smith, were happily raising a daughter and two sons in their native Canada. Quaggin had turned down various leadership roles in the U.S. as her next career step. The timing had not been right — until it was in 2012 when Neilson came calling with an offer to join Northwestern as head of the Division of Nephrology and Hypertension. The opportunity to build on the innovative science and clinical offerings of the division on both the Chicago and Evanston campuses was too good to pass up. In 2013, Quaggin moved her family to the Windy City for the first of her many leadership roles at Northwestern and beyond.

LEADERSHIP STRENGTH

In the 10 years leading up to chairing the Department of Medicine, Quaggin has not rested on her laurels, although there have been many. For example, she was instrumental in helping launch Northwestern Medicine's first home dialysis program — a treatment strategy pioneered in Toronto, Canada — to improve outcomes and increase options for patients with kidney disease and failure. She has conducted extensive kidney and vascular health research at Feinberg using her scientific expertise to help advance understanding of kidney and vascular diseases. As director of the Feinberg Cardiovascular and Renal Research Institute, she is continuing to lead a critical mass of investigators to put Northwestern on the map for breakthrough cardiovascular and nephrology research — from the discovery of new therapeutic targets in diseases of the kidney, heart, blood, and lymphatic vessels to development of new technologies and platforms to accelerate discovery.

Since assuming her new leadership role, Quaggin and her team have been developing a strategic plan guided by Northwestern Medicine's core mission of "Patients First." Enhancing engagement and communication have been among the first major pushes of Quaggin's administration. "With close to 2,000 faculty, trainees, and staff across multiple sites, a large department like ours naturally has silos," she explains. "Right now, we are working to break those down so we can build the foundation for developing a health system that will revolutionize healthcare through research, education, and clinical innovation."

An American Heart Association distinguished scientist, Quaggin is immediate past president of the American Society of Nephrology (ASN), an elected member of the National Academy of Medicine, the National Academy of Inventors, and the American Academy of Arts and Sciences, and is serving as an elected councilor of the Association of American Physicians. She credits her many mentors for supporting her leadership journey and the experiences she gained that will inform her way forward as a department chair.

In fact, it was involvement in a national effort during Quaggin's 2021 to 2023 tenure as ASN president that further convinced her that being in a position to make positive change is a privilege, honor, and a challenge she would relish. In September 2021, following a nationwide call to remove social constructs from clinical algorithms, the more than 21,000-member organization, in partnership with the National Kidney Foundation, was the first specialty organization to establish a taskforce to reassess the use of race in clinical algorithms. The two largest organizations representing health professionals and kidney patients recommended a new race-free approach to diagnosing chronic kidney disease. Intended to help eliminate racial disparities and promote healthcare justice, this important recommendation has now been implemented throughout the United States. Until this point, laboratory diagnostic tests had used a race variable to detect and assess kidney disease, which led to inequitable outcomes for racial and ethnic minority groups already disproportionately impacted by diabetes, hypertension, and kidney disease.

"All of a sudden, I had this bully pulpit to advocate for issues for which I felt deeply passionate," Quaggin says, reflecting on the interviews she gave to news agencies around the country and meetings she had with policymakers in Washington, D.C. "It was an opportunity of a lifetime to work with an incredible team to help make a difference, and I loved it! That's how I feel about leading the Department of Medicine and am so excited for what we can accomplish as we look ahead." ❖

"WE HAVE THE EXPERTISE, TALENT, AND COMMITMENT TO STEP OUT IN FRONT AND LEAD ALL THE POSITIVE CHANGES CURRENTLY TAKING PLACE IN HEALTHCARE NATIONALLY AND GLOBALLY."

SUSAN QUAGGIN, MD

A New Vantage Point

By MAAB President Nupur Ghoshal, '01 PhD, '03 MD

I've often said that Alumni Weekend is an opportunity to return to campus to reconnect and reminisce. Alumni Weekend 2024 was no different in that regard; however, this year I found myself with a new vantage point: seeing the weekend through the eyes of the current Northwestern University Feinberg School of Medicine students. From eagerly showcasing their programs to seeking mentorship, the current batch of students demonstrate their intent to succeed at Feinberg and beyond.

The Alumni Weekend festivities kicked off on Thursday with a mock patient encounter and tour of the impressive Simulation Center. Next, we moved to Hughes Auditorium for a performance from the Northwestern Medical Orchestra (NMO), a group comprised of Feinberg students, faculty, residents, investigators, and staff. In addition to the fantastic performance showcasing the high caliber of these musicians, there was a panel of students that led a discussion on what NMO means to them in terms of community and well-being. It was enjoyable meeting students at the reception afterwards, hearing about their commitment to NMO, and their plans to seek funding to make it sustainable for years to come.

On Friday, Alumni Weekend was in full swing, with exciting events taking place on and off campus. I attended the Mentoring Lunch with the students, and while my table was for those interested in neurology, our discussion quickly expanded to life beyond medical school. Fielding questions about work-life integration, I recognized that students view us alumni as sounding boards and can speak candidly with us as we are not one of their current instructors. The students received our counsel with enthusiasm and reverence, and we were happy to provide such guidance.

The Women in Medicine (WIM) Tea at the Drake never disappoints, and this year a student was among the panelists who shared her story, setting the tone for the attendees to share their own unique experiences when the tea moved into an informal conversation. Following Conversations with the Dean, we moved into Celebrate in Chicago, an event I look forward to as I have the distinct honor and privilege of welcoming all reunion years and recognizing the 50-year class and those attending from our Half Century Club, in particular.

Saturday morning began with the Pancakes and Perspectives breakfast, which is one of the many mentoring events sprinkled throughout the weekend. At noon, we reconvened at the Commitment to Scholarships Luncheon where we met with current scholarship recipients. It was a grand event that focused on the students and the unique paths that led them to Feinberg. Their trajectories (all upward, of course) are truly remarkable. It was another opportunity to form alumni-student connections and learn of their plans moving forward. In the evening, many of us attended the Founders Society reception. While I met up with my classmates, I chatted with several students, including a medical school aspirant who planned to take a gap year and was interested in discussing how best to use her time. I introduced her to Northwestern's Summer Internship Grant Program (SIGP) which provides funding to summer interns.

> ***"In our practices we all strive to be patient centered. When it comes to Feinberg, I encourage you to offer a similar student-centered approach to connect the past to the present by providing mentorship."***

I ended my evening with a raucous reunion with my class, and we marveled at the current Feinberg students and how they are ready to take on the world. And whether it be through direct patient care, tackling big data, or getting involved with pharma or med tech, the possibilities are endless for these stellar students.

As the weekend came to a close, I was left with a few thoughts, and for you, my fellow alumni, a call to action. In our practices we all strive to be patient-centered. When it comes to Feinberg, I encourage you to offer a similar student-centered approach to connect the past to the present by providing mentorship. It is a crucial first step towards paying it forward to our current students and soon-to-be fellow alumni. Please reach out to the Medical Alumni Association Board or me to engage in mentorship and learn about other ways to get involved in student outreach. Keep your eyes open, these students are going places, and you are in the position to guide them.

Feinberg Classmates Reconnect and Reminisce at Alumni Weekend 2024

For Barb Dedo, returning to Feinberg for this year's Alumni Weekend in honor of her late husband, Richard "Dick" Dedo, '64 MD, '69 GME, brought back fond memories of their love story and her husband's career.

Dedo and her husband met on Feinberg's campus while she was working as a medical technologist at Wesley Memorial Hospital (now Prentice Women's Hospital) and while he was completing his orthopedic surgery residency. After graduating from medical school, Dedo's husband practiced spinal orthopedic surgery in Florida and California until his passing in 2021.

"I met him when he was a dashing young intern in white. We got married when he was a second-year resident, and then he did a fellowship at Children's, and then our first baby was born at Wesley, and through the years, Dick would say to anyone who would sit and listen that Northwestern was responsible for his success in life," Dedo says.

In 2013, Dedo and his classmates Howard Schuele, '64 MD, '71 GME, Tim Sullivan, '64 MD, and Howard Kidd, '64 MD, established Feinberg's Class of 1964 Scholarship, which continues to support medical students at Feinberg.

"I'm going to be meeting up with two of our friends. We had a posse of five couples. Every year, whether it was a significant reunion year or not, that was our excuse to get together. The guys were fast friends in the school and the wives got to know each other through the reunion. So, the reunion was always important to us," Dedo says.

More than 450 alumni and guests returned to Feinberg in April to reconnect with former classmates, learn about the medical school's latest developments and achievements, and reminisce about their medical school experiences at this year's Alumni Weekend celebration.

William Iverson, '74 MD, a member of Feinberg's Half Century Club, which includes alumni who have been graduates of Feinberg for 50 years or more, said he was thrilled to reconnect with his classmates and be able to return to Feinberg's campus for the first time since he graduated medical school.

"To go to an institution where they thought we were something special and that we were going to do something outstanding in our lifetime... they were right. I've been in practice for 46 years now, and I know how I've impacted my patients' lives. Northwestern was the start of it all," Iverson says.

During the weekend-long celebration, alumni attended social and educational events across Feinberg's campus, including a concert by the Northwestern Medical Orchestra, walking tours of nearby Chicago attractions, and tours of campus facilities, including the Anatomy Lab, the Northwestern Simulation Lab, and the Louis A. Simpson and Kimberly K. Querrey Biomedical Research Center.

The weekend also featured educational forums led by Feinberg faculty about the prevention and treatment of heart failure with artificial intelligence, navigating equity and inclusion in medical education, and the impact of gun violence on health outcomes and the importance of implementing public health policies.

Alumni and current students also had the chance to connect and chat during a mentoring lunch organized by medical specialty.

"I really enjoyed talking with students about pediatrics. One student I spoke to the most was a first year, and we talked about pediatrics and the different types of practices and what he's heard about the grind of primary care and dispelling myths about it," says Michael Salinsky, '94 MD, who attended the mentoring lunch and celebrated his 30th class reunion this year.

WRITTEN BY *Melissa Rohman* • PHOTOGRAPHY BY *Randy Belice*

"I'm delighted to give our alumni an update on what's happening and where things are heading. Feinberg is almost a billion-dollar enterprise, with a research portfolio that's now over 700 million dollars."

ERIC G. NEILSON, MD

In the afternoon, alumnae gathered for the annual Women in Medicine Tea at Chicago's historic Drake Hotel, which featured a candid panel discussion from alumnae who spoke about their challenges and success during their career, achieving work-life balance, and leadership. The discussion was moderated by Kavitha Gandhi, '98 MD, clinical instructor of Dermatology and co-chair of Feinberg's Women in Medicine committee.

"The more I dive into my research, I realize the sign of an effective and efficient leader is cultivating new leaders, so that you have that succession, so that you have accountability, so that you have sustainability.... So, I leave you this: be the leader that you wish you had, especially when it comes to transforming the actions and minds of others," says Dawn Brown, '99 MPT, DPT, EdD, assistant professor of Physical Therapy and Human Movement Sciences and a panelist at this year's Women in Medicine Tea.

The day concluded with remarks from Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean, who shared with alumni and guests an overview of the state of the medical school during "Conversations with the Dean."

"I'm delighted to give our alumni an update on what's happening and where things are heading," Neilson said. "Feinberg is almost a billion-dollar enterprise, with a research portfolio that's now over 700 million dollars."

Neilson updated alumni on the medical school's recent achievements, including Feinberg's involvement in the Chan Zuckerberg Biohub Chicago, new academic leadership appointments across the medical school, and diversity and inclusion programming and events.

On Friday evening, attendees gathered for an all-alumni reception and dinner, which included a salute to the milestone reunion classes, ranging from the classes of 1959 to 2019.

During the dinner, this year's Distinguished Alumni Award was presented to Thomas Quinn, '74 MD, MSc, professor of Medicine and of Pathology at the Johns Hopkins School of Medicine and director of the Johns Hopkins Center for Global Health. Quinn also celebrated his 50th class reunion at this year's Alumni Weekend.

A renowned international leader in HIV, STD, and infectious diseases research, Quinn has authored more than 900 peer-reviewed publications and is scientist emeritus at the National Institute of Allergy and Infectious Diseases and an advisor on HIV and STDs to the World Health Organization, the Office of the Global AIDS Coordinator (PEPFAR), UNAIDS, and the FDA.

"I am both honored and humbled at the same time to receive this award," Quinn says. "Receiving this award was so special in itself, but to be able to share it with my class and to spend the weekend events with my former classmates was the most rewarding and emotional event for me, as I know it was for all of us."

WEB EXTRA

Check out the full album of photos from Alumni Weekend 2024.

Thomas Quinn, '74 MD, traced the origins of the AIDS pandemic, and now he's hunting for a cure.

Global Health Giant

As a clinical infectious disease fellow at the University of Washington in Seattle from 1979 to 1981, Thomas Quinn, '74 MD, MSc, was on the front lines of a race to identify the virus that was causing debilitating sickness and death predominantly in gay men across the United States. A critical clue about the origins of the virus came in the epidemic's second year of recognition when AIDS cases began emerging among heterosexual Haitian immigrants in the U.S.

Quinn jumped at the opportunity to chase this lead to Port-au-Prince, Haiti, where his epidemiologic investigations would trace the virus's origins back to Central Africa. In Kinshasa, Zaire, now the Democratic Republic of Congo, he collected patient samples and sent them to investigators at the Institute Pasteur in Paris, France. The virologists there used Quinn's samples and those collected in France to identify the human immunodeficiency virus (HIV) as the cause of acquired immunodeficiency syndrome (AIDS).

"I helped support that effort, and as an investigator and clinician, that is a very satisfying outcome," Quinn says. "But that was just the beginning of the story."

Quinn continued to write new chapters as he chased the virus around the globe. He was the first to identify HIV infections in India. He also became one of the founding fathers of the field of Global Health. He led the National Institute of Allergy and Infectious Diseases (NIAID) Section of International HIV/AIDS and STDs for almost four decades and has served as the founding director of the Johns Hopkins University Center for Global Health for almost two decades. The field of Global Health, he says, was borne out of frustration over the gross inequity in HIV care that emerged in the late 1990s and early 2000s as powerful antiretroviral therapies became available, but only for those in wealthier nations.

"When I would work at Hopkins taking care of my AIDS patients there, I could treat them with these brand new, revolutionary antiretroviral drugs that would save their lives," Quinn says. "Then, I would fly to Africa to work in clinics and there was no treatment. Those drugs were very expensive and were not available in the rest of the world."

COLLISION COURSE

When Quinn arrived at Northwestern for medical school in 1970, he had already spent a year studying malaria at the University of Notre Dame where he received a Master of Science degree after completing his undergraduate studies in biology in 1969. He continued his malaria studies at Feinberg and fell in love with infectious disease clinical care.

"Infectious diseases allowed me to help patients make a rapid recovery," he says. He noted that just a week of antibiotics could often lead to a full recovery in most infectious diseases.

His desire to pursue a career in international medicine was further cemented by a trip to Europe with his medical school roommate between his first and second year. Their journey took an unexpected turn when they ran out of money two weeks before their flight home and had to work in a pub on the remote Aran Islands in Ireland for food for the remainder of the trip.

"That trip shaped my love of international travel and work," he says.

He completed his internship and residency at Albany Medical Center Hospital in Albany, New York before joining NIAID's Laboratory of Parasitic Diseases as a research associate studying malaria for two years, from 1977 to 1979. Then, his fellowship took his career on a collision course with sexually transmitted diseases and eventually the HIV pandemic, which would be the focus of his life's work for the next 40-plus years. In Seattle, he saw firsthand the stigma and loss associated with this mysterious disease,

WRITTEN BY *Bridget Kuehn*

called AIDS. Many patients faced rejection by family and friends who feared infection. In 1981, Quinn returned to NIAID as a senior investigator in the Laboratory of Clinical Investigation, joined the faculty at Johns Hopkins University School of Medicine and became a special assistant for international programs on infectious diseases at the NIH's Fogarty International Center. In 1983, he and his colleagues working in Zaire found that AIDS was spreading through heterosexual sex and affecting equal numbers of men and women. However, this groundbreaking discovery was met with resistance. Reviewers at *The New England Journal of Medicine* rejected their manuscript arguing they had no proof and insisting that the infection was spread only among gay men or dirty needles. However, in 1984, he and his colleagues published the study in *The Lancet*. The same year, he co-founded Project SIDA, a collaboration among Zaire, the United States, and Belgium to study AIDS in Central Africa. By 1985, Quinn was leading the Section of International HIV/AIDS and STDs at NIAID, a role he held until last year. He now serves as NIH Scientist Emeritus in the Office of the Scientific Director at NIAID.

"There was a lot of denial about transmission in those early days," he says. "It became politicized and stigmatized."

The first antiretroviral drug didn't become available in the U.S. until 1987, setting in motion a sea of change in HIV/AIDS care. The first therapies were highly toxic and triggered drug resistance after just six months, says Quinn, who witnessed that early revolution as both a clinician caring for patients and as a member of the U.S. Food and Drug Administration's Antiviral Review Committee from 1992 to 1996. However, it wasn't until the mid-1990s that triple therapies became available and revolutionized care for what had been a universally lethal disease into a treatable chronic condition.

"It took us to 1996 — 15 years from the first case being recognized," he says. "But once that happened, we were off to the races. New and more potent drugs came along, and now we are down to one pill per day."

BIRTH OF GLOBAL HEALTH

But that revolution in care didn't reach all patients. Quinn lobbied and advocated for generic drug development and drug company donations to help his patients in Uganda who continued to have no access to effective therapy. He says the efforts faced resistance from clinicians who felt patients in rural Africa could not keep up with the treatment regimens.

"That changed once we showed that with these treatment regimens, patients [in Africa] were living as long as anyone in the United States," he says.

The inequity and the destabilizing effects of the HIV/AIDS pandemic also galvanized international leaders. In 2000, the United Nations Security Council unanimously passed a resolution to address the HIV/AIDS pandemic globally and created the Global Fund for AIDS, Tuberculosis, and Malaria, and President George W. Bush created the President's Emergency Plan for AIDS Relief (PEPFAR) in 2003. These and other global health efforts have helped expand the reach of effective HIV therapies with about three-quarters of the 39 million people living with HIV receiving therapy, according to the World Health Organization. The focus of global health has also expanded to include international efforts to improve health overall, including chronic diseases and mental health.

"It's a great success story," Quinn says. "I'm glad to be a small grain of sand in a much larger beach of people who worked hard to make a difference worldwide. My hats off to everyone who pitched in."

In 2006, Quinn became the founding director of the Johns Hopkins University Center for Global Health, and he continues in that role today. For much of the last five years, Quinn's lab has focused on developing a cure for HIV, but he briefly put that work aside when the pandemic hit to focus on COVID-19, with again a major focus internationally. His lab now studies both viruses. He continues, however, to marvel at how far global health and medicine have come since the early days of the AIDS epidemic.

"In my field of medicine, the most momentous occurrence is the biologic revolution that enabled scientists to identify the causative agent of COVID-19, sequence it, develop a vaccine, and come up with treatment all within a matter of months, instead of 35 or 40 years it took for HIV/AIDS," he says. ❖

CAREER HIGHLIGHTS

1969
Earned a bachelor's degree in biology cum laude at the University of Notre Dame

1970
Completed a Master of Science degree in parasitology at University of Notre Dame

1974
Graduated from medical school at Northwestern University

1974–1977
Completed internship and residency at Albany Medical Center Hospital in Albany, New York

1977–1979
Worked as a research associate in the Laboratory of Parasitic Diseases at NIAID in Bethesda, Maryland

1977–2006
Served as a commissioned officer in the U.S. Public Health Service

1979–1981
Completed a fellowship in infectious diseases at the University of Washington in Seattle

1981
Joined the faculty at Johns Hopkins University School of Medicine

1981
Became a senior investigator at NIAID's Laboratory of Clinical Investigation

1985–2023
Served as senior investigator and head of the Section of International HIV/AIDS and STDs at NIAID

2006–PRESENT
Founded and directs the Johns Hopkins University Center for Global Health

2006–2023
Served as associate director for International Research at NIAID

2016–2023
Named a NIH Distinguished Investigator

2024–PRESENT
Named NIH Scientist Emeritus in the Office of the Scientific Director at NIAID

PROGRESS NOTES

We'd love to hear from you! Please share your recent news, accomplishments, and important milestones with us.

Send your updates and high-resolution photos to **medcommunications@northwestern.edu**. We will publish them in an upcoming issue of the magazine.

Left to right: Feinberg classmates Lynn Ables, '85 MD, Patty Cavero, '83 BSM, '85 MD, James (Jim) McAuley, '83 BSM, '85 MD, '87 MPH, Michelle S. Barratt, '85 MD, '87 MPH, '88 GME, spouse of Michael R. Barratt, '85 MD, '88 GMER, '89 GMER, David Asmuth, '85 MD, and Laurie Gutstein, '83 BSM, '85 MD, '86 GME, '90 GME, watch the launch of the SpaceX Crew 8 Dragon from Kennedy Space Center on March 3, 2024. Michael R. Barratt (not pictured) is one of four new members who will be spending the next six months at the International Space Station.

1950s

Robert A. Kyle, '52 MD, recently authored *A Physician's Journey: The Memoir of Robert A. Kyle, MD*. From the book synopsis: *Beginning in the tradition of the prairie reverie with snow-filled winters and single room schoolhouses and ending with a litany of late-life accolades, Dr. Robert Kyle details his life from the farm, to smoke jumper school, to the University of North Dakota, to Northwestern Medical School, the U.S. Air Force and eventually a career at Minnesota's Mayo Clinic.*

1970s

Michael T. Lotze, '75 MD, has been named incoming editor-in-chief of the *Journal for ImmunoTherapy of Cancer (JITC)*. Lotze serves as professor of Surgery, Immunology, and Bioengineering; director of the DAMP Laboratories at the UPMC Hillman Cancer Center; and senior advisor for the Immune Transplant and Therapy Center at the University of Pittsburgh. He previously served as associate editor of the *Journal of Immunotherapy* for more than 10 years and was on the editorial boards and a guest editor for several other journals including *Journal of Leukocyte Biology, Cancer Microenvironment, OncoImmunology, Frontiers in Inflammation, Journal of Innate Immunity, PLOS ONE, Cancer Gene Therapy,* and *npj Regenerative Medicine*.

Thomas Quinn, '74 MD, MSc, was awarded the Northwestern University Feinberg School of Medicine Distinguished Medical Alumni Award at Alumni Weekend 2024. Created in 1998 by then-vice president and dean of the medical school Harvey Colten, this award is presented annually to recognize alumni whose outstanding professional achievements bring honor to the medical school and merit special recognition. *(To learn more about Quinn and his work, see the article* Global Health Giant *on page 32.)*

1980s

Alan S. Wayne, '84 MD, has been appointed senior vice president of Academic Affairs and pediatrician-in-chief at Children's Hospital Los Angeles (CHLA) and chair of the Department of Pediatrics at the Keck School of Medicine of the University of Southern California. Wayne also serves on CHLA's board of directors and served as clinical director of the Pediatric Oncology

Branch of the National Cancer Institute at the National Institutes of Health for 14 years.

Michael R. Barratt, '85 MD, '88 GMER, '89 GMER, (second from left in photo) and his three crewmates launched successfully from Kennedy Space Center in their SpaceX Crew 8 Dragon to the International Space Station on March 3, where they will be aboard for the next six months. 1 *(Image credit: NASA/Bill Stafford)*

Sandra L. Weber, '89 MD, was awarded the American Association of Clinical Endocrinology's highest award, the Master of the American Association of Clinical Endocrinology (MACE®) at the 2023 AACE Annual Meeting.

1990s

Mark Rosenbloom, '90 MD, recently joined the advisory board of Alzheimer's Treatment Centers of America. Rosenbloom is a practitioner and pioneer in the field of longevity medicine. He is founder and chief medical officer of LIFEFORCE Medical Institute which focuses on longevity and optimal performance medicine. He also is founder of PEPID LLC (a premier point of care medical/drug and decision support software), the Unicorn Children's Foundation, and the Boca School of Autism. 2

Allen Ghorashi, '93 DDS, recently published a blog for the American Academy of Implant Dentistry (AAID) LifeSmiles portal, "Implant Dentistry: One of Many Dental Disciplines." Ghorashi is based in Ramsey, New Jersey and has been in practice for 25 years with 15 years in surgery and restorations. He is an AAID fellow and a diplomate in implant dentistry with the American Board of Oral Implantology.

Kavitha Gandhi, '94, '98 MD, '99 GMER, and ***Shelly Vaziri Flais, '95, '99 MD, '02 GMER***, co-chairs of the Northwestern University Feinberg School of Medicine Medical Alumni Association (MAA) Board Women in Medicine Committee, were recently celebrated in *Crain's Chicago Business* 2023 Notable Women in STEM. Honorees demonstrate leadership through mentoring, involvement in professional organizations, and participation in community and civic initiatives. Gandhi and Vaziri Flais lead efforts to promote women in STEM via programming that includes mentoring high school students interested in STEM, providing panel discussions about STEM careers with a focus on issues facing women in medicine, and participating in twice-yearly mentoring programs with My Block, My Hood, My City.

Sudip K. Bose, '95, '99 MD, is featured in a new, gripping documentary. This intense and heartfelt series, *Desert Doc*, follows Bose in his work as an emergency physician in West Texas at Medical Center Hospital — the highest-level trauma center for 38,000 square miles. A former U.S. Army combat physician, Bose provided treatment to soldiers in the most dangerous war zones of Iraq and treated Saddam Hussein after his 2003 capture. Bose is a Bronze Star recipient, awarded in recognition of his completion of one of the longest combat tours by any physician since World War II. *Desert Doc* is an inspiring, must-watch documentary and is available to stream on Amazon Prime Video. 3

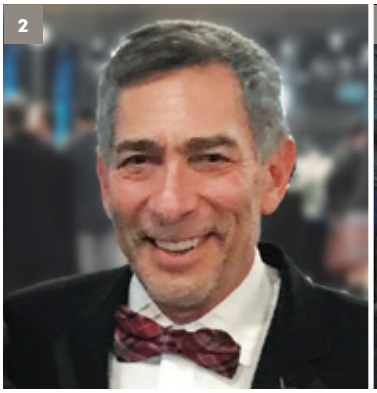
GIL D. RABINOVICI, '01 MD, GAVE THE MENDELSON ANNUAL LECTURE AT THE 30TH ANNUAL ALZHEIMER DAY HOSTED BY THE MESULAM CENTER FOR COGNITIVE NEUROLOGY AND ALZHEIMER'S DISEASE AT NORTHWESTERN UNIVERSITY FEINBERG SCHOOL OF MEDICINE.

2000s

Jeffrey M. Brandt, '01 CERT, certified prosthetist-orthotist of Brandt Ventures, recently announced a $10,000 donation over two years to the Orthotics and Prosthetics Foundation for Education and Research. The gift will sponsor six prosthetic and orthotic patient-care providers with one-year subscriptions to the National Limb Loss & Preservation Registry (LLPR).

Gil D. Rabinovici, '01 MD, gave the Mendelson Annual Lecture at the 30th Annual Alzheimer Day hosted May 3 by the Mesulam Center for Cognitive Neurology and Alzheimer's Disease at Northwestern University Feinberg School of Medicine. Rabinovici is the Edward Fein & Pearl Landrith Distinguished Professor at University of California, San Francisco (UCSF) and director of the UCSF Alzheimer Disease Research Center. Alzheimer Day showcases


1


2

3


4


5


6


7

Alzheimer-related dementia and aging research conducted throughout Northwestern. 4

Zebadiah "Zeb" M. Kimmel, '04 MD, MBA, has been named chief product officer for AMC Health, a leader in end-to-end virtual care solutions. Before AMC Health, Kimmel held vice president positions in both Product and Engineering for Medically Home, a leading provider of hospital-at-home services, and led teams serving governments, hospitals, pharmaceutical firms, and medical device manufacturers worldwide at McKinsey's Healthcare Technology Practice.

Hema L. Ramkumar, '06, '11 MD, is co-founder and CEO of Oculogenex. Ramkumar, a retinal surgeon, founded the company in 2020 alongside her father, a former aerospace engineer. Together, they developed a targeted gene therapy injection that seeks to stop or reverse blindness, specifically dry macular degeneration. Their research is supported by the National Science Foundation and the International Space Station National Laboratory.

HEMA L. RAMKUMAR, '06, '11 MD, IS CO-FOUNDER AND CEO OF OCULOGENEX. RAMKUMAR, A RETINAL SURGEON, FOUNDED THE COMPANY IN 2020 ALONGSIDE HER FATHER, A FORMER AEROSPACE ENGINEER.

Sarah Eickmeyer, '07 MD, '11 GMER, associate professor of Physical Medicine and Rehabilitation, was recently named chair and clinical service chief for the Department of Physical Medicine and Rehabilitation at the University of Kansas School of Medicine (KUSOM). She previously served as KUSOM's appointed residency program director and was selected for the role of assistant director in the Medical Alumni Society Learning Community Program. Eickmeyer also served as medical director of Inpatient Rehabilitation for The University of Kansas Health System. She was elected to the Association of Academic Physiatrists Residency and Fellowship Program Directors Council and serves as chair of the American Academy of Physical Medicine and Rehabilitation Self-Assessment Committee. Eickmeyer is an oral examiner, exam item writer, and neuromuscular and electrodiagnostic medicine content specialist for the American Board of Physical Medicine and Rehabilitation; serves on the associate editorial board of *PM&R: The Journal of Injury, Function and Rehabilitation*; and is a peer reviewer for *Medical Teacher*.

Himabindu Vidula, '07 MD, '10 GMER, '13 GMEF, '14 GMEF, was recently elected to serve as chair of the American College of Cardiology (ACC) Board of Governors and secretary of the Board of Trustees. Vidula will lead governors from chapters representing all 50 states, the District of Columbia, Puerto Rico, Canada, Mexico, and representatives from the U.S. health services. 5

David James "D.J." Kennedy, MD, '09 GMEF, was recently elected president of the American Academy of Physical Medicine and Rehabilitation. He is professor and chair of the Vanderbilt University Medical Center Department of Physical Medicine and Rehabilitation. Kennedy is a member of the board of directors of the North American Spine Society, serving as the inaugural director of the Strategic Growth Council, and serves on the board of directors of Nashville Public Television.

Hercules D. Logothetis, '09, MD, '18 GMER, owner of Eye Physicians of Libertyville, a state-of-the-art ophthalmology clinic, recently announced that his company has acquired Northern Illinois Eye Clinic in Mundelein, Illinois.

2010s

Emma R. Daisy, '11 MD, '14 GMER, was recently appointed president of the Illinois Academy of Family Physicians (IAFP). Daisy is a family physician at Tapestry360 Health. She joined IAFP as a first-year resident and has served in several capacities for the organization. Her focus is on health equity and primary care access for patients of all ages. 6

Paul M. Duffin, '11 PhD, was recently named as one of the inaugural Bingham Endowed Chairs for Teaching Excellence at Transylvania University in Lexington, Kentucky. Duffin is also associate professor of Biology at the university and serves as the presiding faculty officer. Duffin's research includes the areas of molecular microbiology, bacteriology, bacterial pathogenesis, and bacterial genetics. He also works extensively training students in his lab during the summer to provide them with additional experience.

Amit B. Ayer, MD, '19 MBA, '20 GMER, and ***Nikhil K. Murthy, MD, '21 MBA, '22 GMER***, recently partnered with Weinberg College of Arts and Sciences alum ***Casey G. Qadir, '19*** to form Hubly Surgical. The partnership took place as part of NUvention Medical, a graduate-level course offered by the Farley Center for Entrepreneurship and Innovation at Northwestern University McCormick School of Engineering. Qadir identified the need to modernize the standard two-person hand-crank cranial drill while studying neuroscience as an undergraduate. As neurological surgery residents, Ayer and Murthy worked with Qadir to develop Hubly Surgical's battery-powered drill with a variety of safety features including an auto-stop mechanism, a cone-shaped drill bit to protect against over-penetration, and a color-changing LED light that allows users to determine if they are applying the correct amount of force. The Hubly Drill was piloted at Northwestern Medicine and aided in saving the life of an ICU patient. 7

2020s

Abigail R. Citterman, '24 MPO, was recently awarded the American Academy of Orthotists and Prosthetists (AAOP) Women in O&P Research Award. A recent graduate of Northwestern's Prosthetics-Orthotics Center's (NUPOC) Master of Prosthetics and Orthotics (MPO) program, Citterman received the award at the AAOP's 50th Annual Meeting and Scientific Symposium in Chicago. 8

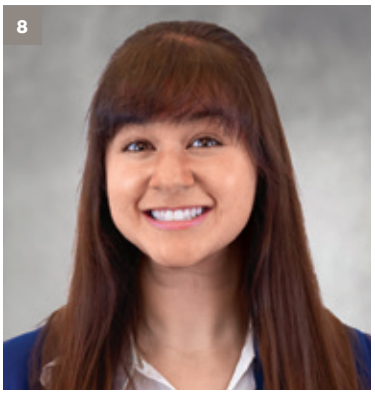
DPT

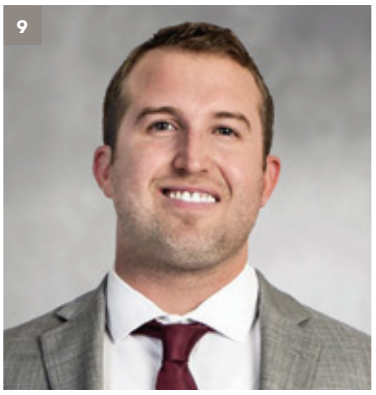
Justin M. Lantz, '12 DPT, was selected for the Spineline Top 20 Under 40 Award by North American Spine Society (NASS). He is the first physical therapist (DPT) to ever win this award. 9

Emily J. Morris, '09 PT, DPT, was selected as a recipient of the Michigan Department of Health and Human Services Equity and Inclusion Coin, which recognizes diversity, equity, and inclusion champions who are successfully increasing access and opportunities for all people while building better outcomes for historically and currently disadvantaged populations. Morris was recognized for her recent work, fostering equitable community engagement by challenging long-established policy development practices in favor of more innovative and transformational community engagement techniques. Morris has served in leadership roles on several state government-led special projects and, most recently, led the design and implementation of Michigan's Medicaid policy introducing coverage for community health worker services. With a board specialty in geriatrics, Morris is active with the Michigan chapter of the American Physical Therapy Association and volunteers across the state at universities and events, teaching and conducting senior athlete health screens. 10

Meghan A. Lamothe, '17 PT, DPT, is co-author of a recent study titled "Management of Concussion in the Young Athlete," which seeks to analyze the differences in concussion symptoms, treatment, recovery, and psychological implications in children, as well as the role of the physical therapist in the management of pediatric concussion. 11

Hannah Sy, '24 DPT, was named the winner of the 2023-2024 *Journal of Humanities in Rehabilitation* (JHR) Student Essay Contest, co-sponsored by the American Counsel of Academic Physical Therapy (ACAPT). The seventh in an annual series, this national contest offers a creative opportunity to ignite critical reflection in physical therapy students across the nation to support holistic approaches to patient care.


8


9


10


11

PHOTOGRAPHY BY *Nathan Mandell*

In Memoriam

Northwestern Medicine expresses its condolences to the families and friends of the following alumni (listed in order of their graduation year) and faculty who have passed away.

ALUMNI

Leonard H. Kahane, '49 DDS
January 9, 2024
MANITOBA, CANADA

Ben Powell, II, '49 MD
January 3, 2024
GRAND JUNCTION, CO

Sheldon W. Rosenstein, '51 DDS
December 20, 2023
BUFFALO GROVE, IL

Barrett D. Anderson, '52 DDS
December 18, 2023
ATHERTON, CA

David L. Detamore, '53 DDS
January 16, 2024
PORTAGE, IN

James E. Robinson, Jr., '53 MD
November 10, 2023
WINSTON-SALEM, NC

Margaret Wipf, '53 BSDH
December 17, 2023
SALEM, OR

James J. Monge, '55 MD, '56 GMER
January 14, 2024
DULUTH, MN

John A. Hull, '56 MD
February 6, 2024
CORVALLIS, OR

Kenneth N. Cutler, '57 DDS
December 15, 2023
SALT LAKE CITY, UT

James M. Orth, '57 MD
February 1, 2024
SAN JOSE, CA

Ronald E. Masters, '59 MD, '62 GME
January 29, 2024
OXFORD, PA

Richard A. Mladick, '59 MD
December 6, 2023
VIRGINIA BEACH, VA

James F. Bellenger, '60 MD
February 7, 2024
CLARKESVILLE, TN

Moira Breen, '60 PhD
January 26, 2024
LIBERTYVILLE, IL

Ira S. Halper, '60 MD
December 1, 2023
SKOKIE, IL

Henry H. Roenigk, Jr., '60 MD
December 10, 2023
SCOTTSDALE, AZ

Barbara Sadoff, '60 BSED
February 16, 2024
LOS ANGELES, CA

Rush A. A. Lenroot, '62 DDS
December 26, 2023
ALBUQUERQUE, NM

Robert A. Lordahl, '62 DDS
December 21, 2023
LAKEWOOD, WA

Charles Vincent Gilliland, '63 MD
March 10, 2023
RANCHO PALOS VERDES, CA

Charles G. Huizenga, '63 MD
December 16, 2023
DEDHAM, MA

Alexander M. McBride, '63 MD
January 2, 2024
SPEARFISH, SD

Joshua Shere, '63 MD
December 1, 2023
LOS ANGELES, CA

Raymond F. Young, '63 DDS
January 3, 2024
MUNDELEIN, IL

George Marsh, '67 DDS
January 26, 2024
CHANDLER, AZ

Kenneth B. Graulich, '70 MD
January 29, 2024
LEXINGTON, KY

Michael W. Stelling, '71 MD
January 3, 2024
HOUSTON, TX

Neil K. Nixon, '72 DDS
December 22, 2023
WEST VALLEY CITY, UT

Leonard J. Cerullo, MD, '77 GMER
January 16, 2024
VALPARAISO, IN

Cynthia J. Patton, '79 MSPT
December 1, 2023
RIVERSIDE, CA

John Ashton Gibbel, '81 BSPT
February 15, 2024
ARLINGTON HEIGHTS, IL

Stephen H. Miller, '82 MD
February 1, 2024
LAS VEGAS, NV

Paul W. Macellari, '86 PhD
February 1, 2024
SOUTH BEND, IN

FACULTY

John Phair, MD, professor emeritus, Medicine
February 13, 2024
EVANSTON, IL

John P. Phair, MD, professor emeritus, died peacefully on February 19, 2024. He was 89.

Phair was a leading investigator of HIV infection, and from 1987 to 2012 he served as chairman of the executive committee of the Multicenter AIDS Cohort Study (MACS), a National Institutes of Health (NIH) supported investigation of the natural history of HIV. Investigators from Northwestern University Feinberg School of Medicine, Johns Hopkins University Bloomberg School of Public Health, the University of Pittsburgh, and the University of California at Los Angeles collaborated in this study, which was the first and groundbreaking evaluation of HIV infection.

In 1987, with investigators at Rush University, Phair established the Chicago AIDS Clinical Trials Unit, a component of the NIH-funded consortium of 30 U.S. medical centers, termed the AIDS Clinical Trial Group, which evaluated treatment of HIV infection and its complications. From 1992 to 1994, Phair was selected to lead the executive committee of this group. Later, from 2000 to 2002, he chaired the AIDS Research and Advisory Committee of the National Institute of Allergy and Infectious Disease.

In 2005, Phair was honored by the American College of Physicians with the John Phillips Memorial Award for Outstanding Work in Clinical Medicine. In 2010, Phair became the first recipient of the International AIDS Society–USA (IAS–USA) Lifetime Leadership Award. Upon his retirement, Feinberg established the John Phillip Phair Professor of Infectious Diseases Chair recognizing his inspiring dedication and leadership in his field.

Born in Paris, France in 1934, Phair graduated from Yale University where he captained the swimming team and was selected for the All-American Team in his senior year. He graduated from the Medical College of the University of Cincinnati in 1960 and returned to Yale for training in Internal Medicine and Infectious Diseases.

In lieu of military duty, from 1962 to 1964, Phair served in the U.S. Public Health Service at the Atomic Bomb Casualty Commission in Hiroshima, Japan, where he conducted investigations into the late effects of radiation among the atomic bomb survivors. In 1975, Phair took a sabbatical to work in Professor Chris Potter's virology and immunology lab at the University of Sheffield Teaching Hospital in England.

During his academic career, Phair authored more than 365 publications and 45 chapters in medical texts. He served as the president of the Central Society of Clinical Research and was honored with the Distinguished Alumni Award from the College of Medicine, University of Cincinnati.

John was pre-deceased by his parents Phillis Wolfe and John Joseph Phair. He is survived by his wife, Nancy (née Routt), his son, Phillip, an IT consultant in Germany and wife Melanie Karzmyrski; his daughter, the recording artist Liz Phair; and his three beloved grandchildren, Nick Staskauskas, Acelya Phair, and Dillon Phair.

Patient's Gift Supports Precision Medicine and Ataxia Research

Precision or "personalized" medicine can sound a lot like science fiction. In the Ken & Ruth Davee Department of Neurology at Northwestern University Feinberg School of Medicine, scientists can grow neurons from skin cells obtained from a patient and directly test the mechanisms of disease, as well as potential treatments, on these patient-specific neurons.

Steven Denning, a prominent businessman and philanthropist from Greenwich, Connecticut, was referred to neurologist Dimitri Krainc, MD, PhD, the Aaron Montgomery Ward Professor, director of Simpson Querrey Center for Neurogenetics and Feinberg Neuroscience Institute, and chair of the Ken and Ruth Davee Department of Neurology, for his symptoms in 2021. With help from Krainc's state-of-the-art lab capabilities and clinical and research specialists, he was diagnosed with CANVAS, a recently identified condition characterized by cerebellar ataxia and neuropathy. Knowing the diagnosis, which was informed by genetics, Krainc and his associates were able to design a plan for the development of potential treatments.

The word "ataxia" means lack of coordination. People with ataxia have problems with balance and coordination when they move, and it emerges as a symptom caused by different diseases. The condition can also affect speech.

As a patient, Denning was impressed with the precision medicine techniques developed in Krainc's lab. In September 2023, he and his wife Roberta donated generously to help strengthen and sustain Krainc's program. The department also plans to establish the Denning Ataxia Center, capitalizing on the infrastructure already available within the department and the clinic's designation last year as an Ataxia Center of Excellence.

"My ultimate hope is that [Krainc] and his team studying CANVAS can come up with a therapeutic to address the balance issues that are prevalent in the diagnosis," Denning says.

A NEW ERA FOR THERAPEUTICS

Scientists at Northwestern aim to bring precision medicine into the mainstream — all under one roof.

Krainc leads the Simpson Querrey Center for Neurogenetics, which comprises a network of colleagues across the medical school, health system, and university. The center promotes integrated and multidisciplinary approaches to biobanking, genetic testing, studies of disease mechanisms, drug discovery, and clinical trials — the core tenets of its mission. It has distinguished itself from similar initiatives by providing a centralized and coordinated program that brings together clinicians and investigators in an effort to tackle the most pressing challenges in neurology.

"The unique angle of our program is how we strategically recruited experts from different areas of science and medicine to develop all components of precision medicine in a coordinated manner," Krainc explains.

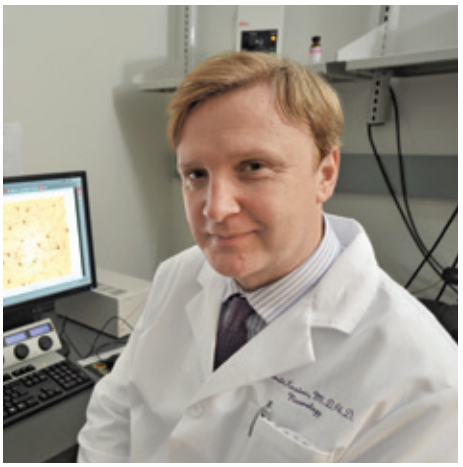
To provide personalized medicine for a patient with a neurological disease, neurologists first obtain information about the patient's genetics and clinical features then conduct a skin biopsy. In the lab, the patient's skin cells are reprogrammed into stem cells that are then differentiated into neurons. Scientists study such neurons to decipher mechanisms of disease that are unique to the patient and, ultimately, test potential treatments.

Denning led an active life prior to the onset of his CANVAS symptoms, co-founding and serving as chairman of General Atlantic LLC, a global private equity firm, and as board chairman at Stanford University, in addition to other nonprofit board service. His ataxia symptoms affected his ability to do activities he once enjoyed, such as running, hiking, and skiing. He said he appreciated Krainc's bedside manner and realistic but warm approach.

"His approach is one that leaves me with great hope for eventual treatment, which is important in coping with a disease that can take away hope," Denning says.

This story was originally published in the March 2024 issue of The Philanthropist.

Steven Denning



Dimitri Krainc, MD, PhD, the Aaron Montgomery Ward Professor, director of Simpson Querrey Center for Neurogenetics and Feinberg Neuroscience Institute, and chair of the Ken and Ruth Davee Department of Neurology

SPOTLIGHT ON *Scott Hamstra, '85 MD*

OPENING DOORS TO HEALTHIER COMMUNITIES

Scott Hamstra, '85 MD, credits his time at Northwestern University Feinberg School of Medicine for expanding his horizons and ultimately sparking his interest in improving the health of underserved and vulnerable populations.

"I grew up as a very middle-class, white American male," says Hamstra. "Northwestern provided a jolt, a remarkable melting pot for exposure and ideas and diversity. We had people from all over the world, and the med students, despite their youth, brought experience that was much wider and deeper than my own."

Inspired by a Feinberg classmate who grew up in Pakistan, Hamstra traveled to Pakistan with a fellow student for the summer to work in a mission hospital. "It was mind-blowing and eye-opening to experience a very different culture, extreme poverty, and see pathology that is rarely encountered in the United States. This profound experience opened a door to professional possibilities."

Hamstra's faculty advisor at Northwestern, the late pediatrician Wayne Borges, MD, encouraged him to pursue pediatrics. Hamstra would go on to do his residency and a fellowship in pediatric infectious disease at Oakland Children's Hospital in Oakland, California.

"I love the energy and the inherent magic that's in children to heal," says Hamstra. "They're incredibly resilient characters — their immune systems, their bodies, the energy, just the desire to live is amazing."

In 1990, Hamstra became a U.S. Public Health Officer with the Indian Health Service (IHS) joining a medical staff of 12 at the Whiteriver Indian Hospital that serves the White Mountain Apache Tribe in rural Arizona. At the time, this community, like many other indigenous communities, was contending with a host of infectious diseases, including measles, Hepatitis A, Hemophilus influenza type B, varicella (chickenpox), pneumococcus, and rotavirus, for which vaccines were still in development.

As vaccines for these diseases became available, the number of cases diminished rapidly. "I saw the very last two cases of hemophilus influenza type B meningitis (Hib) in the spring of 1990," Hamstra says, before Hib disease was eliminated by vaccination. "Chickenpox was everywhere, and then we got that vaccine and it just disappeared. We implemented the pneumococcal conjugate (PCV7) vaccine, and then that disease too practically disappeared. Enormous credit goes to the community who trusted us and trusted the vaccines."

Hamstra says he believes that talking about medicine and immunizations in a way that resonates with a specific patient population is critical for demystifying them. "We compare vaccines to seatbelts, and we don't call them immunizations, we call them shots because that's what the people call them," he says. "You get very practical and ask, 'Who do you want to protect?' Of course, you want to protect your kids, you want to protect grandma, you want to protect your whole extended family. What if you could do it? What if you could prevent this? As public health officers, we didn't focus on just one person, we thought about them in context of their family and community."

When Hamstra first started working in Arizona, he says he and his team were using notebooks to record immunization data. A computer platform called RPMS (Resource and Patient Management System) had been developed by IHS for managing patient information and healthcare resources in the 1980s, but it was not yet widely used across its healthcare facilities until the 1990s.

"In hindsight, it's inconceivable to recall that population level vaccine data was virtually nonexistent in the 1980s," says Hamstra. "We just watched this medical system get bigger, better, and more robust. There was something uniquely powerful about caring for pretty much everyone in the community, having a community database, and being able to watch diseases disappear as the rate of vaccinations moved from 0 percent to 25 percent to 50 percent to 75 percent. To be able to be part of this combination of advanced science technology and practical application on the clinical front lines and see firsthand the health transformation of a community was astonishing." Thus, a door to a career in medical informatics opened.

Hamstra led his clinical sites to earn top-ranking awards from the Centers for Disease Control on multiple occasions, with teen and toddler vaccine rates consistently above 90 percent. While he has continued to work with the IHS and American Indian communities in Arizona since retiring in 2014, a new door opened for Hamstra allowing him to use his expertise to improve both pediatric and adult immunization rates among the broader U.S. public in collaboration with public health experts and the American Pharmacist Association Foundation.

Hamstra says he hopes his journey will encourage other students to step outside of their comfort zones. "It's truly been an adventure, unpredictable, surprising, challenging, and rewarding," Hamstra says. "I feel extremely privileged and fortunate to have gotten my start at Northwestern. Hopefully my experience will inspire others to 'Just Say Yes' to whatever doors people open, because you never know where that next door is going to lead."

WRITTEN BY *Christina Frank*

1903

A Woman of Many Firsts: Augusta Webster, MD

Augusta Webster was born on August 31, 1903 in St. Louis. As a child, her family moved to the town of Jacksonville, 90 miles north of St. Louis in west central Illinois. Her father, George Webster, was a physician with a general practice in the Jacksonville area. She would often accompany her father on house calls and in his office. Later in life, she credited this, and two women physicians in her town, for inspiring her to enter medicine despite her father's skepticism. While not discouraging, he did not encourage her either as he knew of the difficulties women faced working as physicians in the early 20th century.

Webster began her long association with Northwestern University as an undergraduate and received her Bachelor of Science degree in 1926. She entered Northwestern's medical school in 1927, only one year after the school began admitting women. Under a quota system intended to keep the number of women in the medical school low, she was one of just four women in her class. She earned her bachelor of medicine in 1931 before completing an internship at Passavant Hospital (she was one of the first women to secure an appointment there) to earn her MD in 1932. Although she had hoped to become a surgeon, Webster turned to gynecology due to a lack of opportunities for women in the surgical field. This was a more acceptable choice for women at the time, and it did have a surgical component. She completed a residency in gynecology at Passavant and another in obstetrics at Cook County Hospital and then went into private practice, following the example of her father. After a few years, she was hired as a clinical assistant in obstetrics and gynecology at Northwestern University Medical School, taking the first step of the next 50 years of her career.

Webster steadily rose through the ranks at Northwestern, becoming an instructor in 1941, a department associate in 1943, assistant professor in 1951, and associate professor in 1953. She followed a parallel track at Cook County Hospital, becoming a resident obstetrician in 1934, an associate in obstetrics in 1936, and an attending physician in 1946. During this time, she helped to establish a family planning clinic at Cook County, as well as a cancer detection center at Women and Children's Hospital.

Another promotion came in 1953, when she was unanimously elected as the Chair of the Department of Obstetrics at Cook County Hospital, making her the first woman in charge of a department at any major teaching hospital in the country.

With such a high-profile place in the medical community, Webster garnered recognition and many awards throughout her career. In the 1940s she became a Fellow of the American College of Surgeons, and she was a Founding Fellow of the American College of Obstetricians and Gynecologists in 1951. In 1954 she was named Woman of the Year by the American Medical Women's Association (AMWA), and two years later she was chosen by AMWA to be part of a nine-woman delegation that visited the Soviet Union to study medical education and practices there. In 1960 she also became a full professor of Obstetrics and Gynecology at Northwestern University Medical School, making her the first female professor at the school.

Webster remained chair of Obstetrics at Cook County for 24 years and retired completely in 1986 at age 83. She died in Chicago on March 20, 1993. Her legacy continues at Northwestern through the Augusta Webster, MD, Office of Medical Education, as well as the Augusta Webster Faculty Fellowship in Medical Education which had been established in 1991 to honor her reputation as a teacher at both Northwestern and Cook County Hospital.

Emma Florio is the special collections library assistant at the Galter Health Sciences Library & Learning Center.
To read the full article, visit galter.northwestern.edu.

Northwestern Medicine®

Feinberg School of Medicine | Office of Communications
420 E. Superior Street | Rubloff 12th Floor
Chicago, IL 60611

MORE ONLINE AT MAGAZINE.NM.ORG.